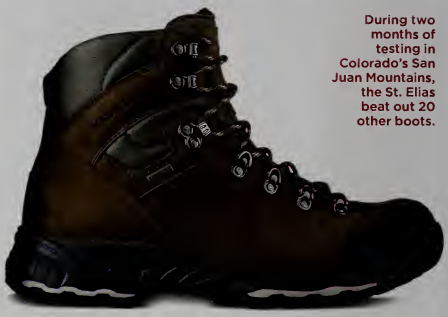
The Adventure-Ready Duffel

Embarking on a lengthy trip? Enlist the **Thule Chasm XL,** an expedition duffel able to swallow more than a week's worth of clothes. Built to be dragged and drenched, the 130-liter bag packs easily thanks to sturdy zips, smart side-access pockets, and an internal mesh pouch for quarantining worn gear. ***$160; thule.com***

The WiFi Network That Pays for Itself

Like many take-anywhere WiFi networks, the 2.1-ounce **Karma WiFi** provides a fast pay-as-you-use-it 4G hookup wherever you are. Unlike others, the device lets you earn free data every time a fellow traveler joins your mini network. ***From $99; yourkarma.com***



During two months of testing in Colorado's San Juan Mountains, the St. Elias beat out 20 other boots.

The Swift and Rugged Hiker

Tough enough for big adventures, yet comfortable enough for day hikes, the **Vasque St. Elias** successfully combine classic, burly leather hikers with new light-and-fast technical shoes. Made from cowhide, they weigh just over three pounds and feature a breathable Gore-Tex liner, as well as a trail-gripping Vibram sole. And unlike many big leather boots, they require no break-in time. ***$190; vasque.com***

The Retro Watch with Distinction

As its top-mounted push buttons suggest, the **CT Scuderia Corsa** is inspired by a stopwatch — specifically those used by Italian motorcycle racers of the Fifties and Sixties. Those buttons control the timepiece's quartz chronograph and, along with its prominent dial markings, set it apart from today's swarms of vintage-inspired minimalist watches. ***$1,295; ctscuderia.com***

The Laptop-Replacing Tablet

Perfect for taking work on the road, the lightning-fast **Nokia Lumia 2520** tablet is more like a Windows microlaptop with WiFi and LTE broadband connectivity, and an optional keyboard that adds a trackpad and USB ports. In addition to its suite of business apps, the tablet's 10-inch widescreen display means you also have a killer way to watch movies in the hotel. ***From $399; nokia.com***

The Game-Enhancing Fairway Wood

If you struggle to get your fairway wood shots airborne (and, really, who doesn't?), the **Adams Tight Lies Fairway Wood** will do wonders for your game. Its inverted head — slender on the crown, wide at the base — cuts a low, efficient profile, reducing turf resistance even as it adds more oomph below the ball. Translation: Fewer depressing dribblers and more majestic missiles, no matter how difficult the lie. Trust us. ***$199; adamsgolf.com***

TAKE IT EASY
The AeroCart requires 75 percent less effort to push a load.

The Shape-Shifting Wheelbarrow

In standard form, the **Worx AeroCart** is a smooth-rolling wheelbarrow that can hold 300 pounds of sod. Pull a pin and move the wheels, however, and the cart morphs into a fridge-lugging hand truck. But that's only the start of its versatility: A series of attachments also transform it into four other forms, including a cylinder dolly (perfect for propane tanks) and rock lifter. ***$180; worx.com***

The All-Weather Backyard Recliner

Replace your saggy deck chair with this roomy, superdurable **Polywood South Beach Ultimate Adirondack.** Constructed of low-maintenance Polywood, it comes in 13 colors. But more important, it can weather any element without showing wear — no repainting, staining, or sealing necessary. Want to kick your feet up? Make it a lounger by pulling out the hideaway ottoman. ***From $470; polywood-furniture.com***

The Double-Duty Charger

Flip out the prongs on the backside of the **Fluxmob Bolt,** and you have a standard USB wall charger. But what makes the 3.1-ounce device unique is its internal 3,000mAh battery that allows it to juice depleted gadgets on the go, far away from an outlet. It's fast, reliable, and, best of all, prevents you from carrying around so many damn devices. ***$60; fluxmob.com***

Annual Reports PPC Vol. 1, 1958

TABLE OF CONTENTS

Fiscal Year 1958
Annual Reports

Volume 1

COOPERATIVE PLANT PEST CONTROL PROGRAMS

Fiscal Year 1958

Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

October 1958

CONTENTS

CROPS REGULATORY AND CONTROL PROGRAMS

The regulatory and control programs in which the Department participates in cooperation with the States, the Republic of Mexico, and Canada fall into three broad categories. These concern: (1) Incipient infestations of newly-introduced pests which through joint effort may be confined to very small areas or eradicated; (2) introduced pests that despite having become rather widely dispersed in the United States can now be eradicated because of recently developed techniques and more effective and less expensive new chemicals; (3) introduced pests that have become established over substantial areas in this country; and (4) insects native to or generally distributed throughout their ecological or host range in this country which outbreak periodically, causing widespread damage or destruction of crops in areas often remote from breeding grounds.

The Department's authority for participating in these programs is contained in the following general and specific Federal legislation: The Federal Plant Pest Act (Public Law 85-36), the Plant Quarantine Act of 1912 as amended (7 USC 151-167), the Pink Bollworm Act of 1930 (46 Stat. 67), the Incipient or Emergency Outbreak Resolution of 1938 (7 USC 148-148e), the Mexican Border Act of 1942 (7 USC 149), the Department of Agriculture Organic Act of 1944, as amended (7 USC (7 USC 147a), the Insecticide, Fungicide, and Rodenticide Act of 1947 (7 USC 135-135k), the Golden Nematode Act of 1948 (7 USC 150-150g), the Halogeton Glomeratus Control Act of 1952 (7 USC 1651-1656), and Public Law 518, the Miller Pesticide Residue Amendment to the Food, Drug and Cosmetic Act of 1938 (68 Stat. 511).

Responsibility for preventing or retarding the spread of introduced pests into uninfested areas is usually shared by the infested states and the Federal Government. Historically, coastal states, particularly those with extensive sea and airport facilities receiving foreign traffic, and states bordering on other countries are most vulnerable to the introduction of new pests. The extended flight range of modern aircraft from foreign airfields, however, permits landings at points far inland thereby endangering establishment of pests in areas far removed from our sea coasts. When new species capable of causing severe damage to crops in this country penetrate the first line of defense which is port-of-entry inspection, the affected states and the Federal Government have jointly-supported programs to eradicate, suppress, or prevent further expansion of infested areas. In many instances such operations are of greatest benefit to the agriculture of noninfested states which cannot, except through their Federal Government, contribute to the programs that protect them. As an example, the golden nematode which currently infests only a few thousand acres of Long Island, New York, is a potentially serious pest of potatoes and tomatoes wherever they are grown in this country. Maine, Idaho, Pennsylvania, California, North Dakota, Colorado, and other states are beneficiaries of this program even though they participate only to the extent of surveys within their own boundaries.

On the other hand, the quarantined states and the growers therein have an inescapable interest in a program of this kind. Where only a part of a state is infested—as in the case of the golden nematode, Hall scale, soybean cyst nematode, witchweed, and others—there may be substantial uninfested areas within their own boundaries exposed to infestation. Furthermore, articles produced for interstate shipment within these infested areas provide revenue for the state of origin. When a regulated commodity is offered for inter- or intrastate shipment to a point outside of a regulated area, it is necessary that a certification be made as to its freedom from the pest if it is to be allowed to compete freely with commodities produced outside of the regulated area. To this end growers frequently provide material aid in carrying out the provisions of a quarantine. States assist in providing inspectors and otherwise contributing to the program.

As a part of the Department's regulatory and control program, cooperative surveys develop information that is needed to advise growers and others as to the prevalence of insect pests likely to cause widespread damage to crops. Agricultural

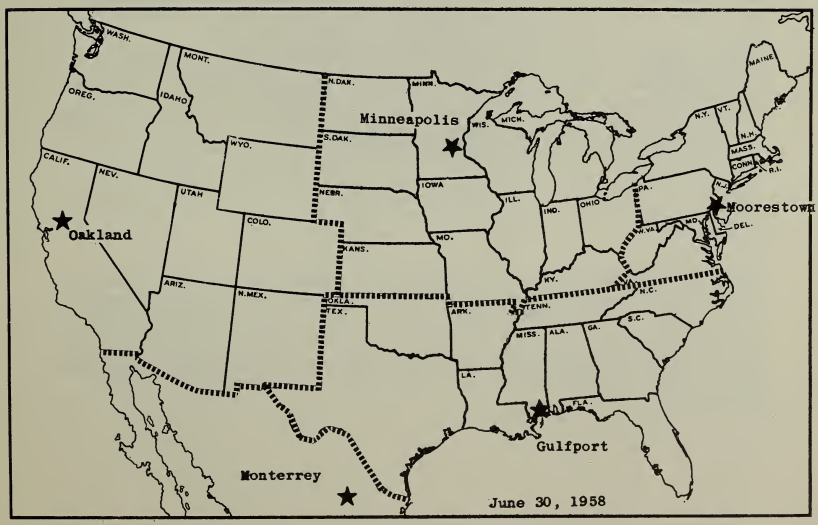
agencies responsible for disseminating information on crop pests such as the Extension Service, Experiment Stations, State Departments of Agriculture, and other state and industrial organizations that engage in educational activities rely on this source of information.

The effective control of many major crop pests requires timely treatment on an area-wide rather than an individual property basis. The survey provides a basis for forecasting outbreaks thus contributing substantially to more effective and less expensive controls. Through the prompt release of information obtained, farmers are warned of impending epidemics and industry has advance knowledge as to where and when large quantities of insecticides will be needed.

The administration of the Federal Insecticide, Fungicide, and Rodenticide Act is an important phase of the Department's regulatory and control responsibility. This legialation provides assurance to farmers and other users of pesticides that the products they purchase can be depended upon to control pests without being injurious to people, useful plants, and animals. The act protects the public from the sale of worthless or dangerous materials by authorizing the Department to give careful scrutiny, before marketing, to formulas and labeling of pesticides. Samples of pesticides collected from dealers' stocks and importations are checked to determine whether or not they are in compliance with the law. If they are in violation, appropriate corrective action is taken by the Department. Operations under the act have greatly contributed to wider public confidence in the use of pesticides resulting in substantial savings to crops and livestock.

A brief review of each of the programs of a regulatory or control nature in which the Plant Pest Control Division actively participated during the fiscal year 1958 is presented on the following pages.

PLANT PEST CONTROL DIVISION REGIONAL OFFICES



BARBERRY ERADICATION

History: Stem rust has been recognized as a serious disease of cereal crops in this country since the very beginning of American agriculture. Even before the time of the Revolutionary War farmers observed stem rust in their grain crops and suspected barberry bushes as the source of the disease. Colonial laws had condemned the barberry before the relationship between rust on the barberry and that on grain had been proved.

Nature of Disease: Stem rust is caused by a fungus that lives alternately on certain species of barberry and mahonia and on grains and grasses. It is spread between host plants by windborne spores. The fungus survives winter temperatures as black rust on the straw of grains and grasses. In the spring infection develops on the leaves of the barberry and the disease is spread to grains and grasses. Once rust becomes established in grain fields, it spreads from plant to plant and from one field to another until harvest time. As the crops mature the black stage again forms on the ripening straw, thus completing the life cycle.

Survey, Quarantine and Control: The organized cooperative barberry eradication program was started in 1918. The objective of the program is to protect small grain from damage caused by stem rust. Rust, coming early as it does from the barberry, often develops to epidemic proportions and causes damage over a wide area before harvest. Races of the rust fungus crossbreed on the barberry and produce new hybrid races some of which can attack grains previously considered resistant. The eradication program therefore serves two purposes: It eliminates the early local sources of stem rust and it destroys the host on which new races of the fungus are produced.

The nineteen states participating with the Federal Government in the program produce approximately 2-1/4 billion bushels of wheat, oats, barley and rye on 93 million acres each year. These crops represent more than $3 billion of annual income. Stem rust reduces both field production and quality of these crops.

Barberry bushes are killed with herbicides—ammate applied to the cutoff canes or with sprays of 2,4-D and 2,4,5-T or combinations of the two applied to the foliage and canes. The enforcement of Federal and State quarantines prevents the re-establishment of susceptible barberries in areas that have been cleared. Barberry eradication when carried to practical completion will have eliminated, permanently, the source of early stem rust epidemics and the important source of new races. As millions of barberry plants have been eradicated in the 19 control states, the years in which stem rust epidemics develop have become less frequent. Stem rust losses may still develop as a result of spores blown in from Mexico and southern Texas where the red (summer stage) of the rust survives the winter months.

The Current Situation: During the year ending June 30, 1958, 2,835,967 barberry bushes were destroyed. These bushes were found on 2,607 properties distributed over approximately 6,500 square miles. Of this area, 4,827 square miles were placed on maintenance and will require only sufficient work in the future on infested sites to maintain the barberry-free condition. Of the 7,528 previously infested sites inspected, 5,392 were without bushes in 1958. The total area in the 19 states requiring future work now approximates 55,614 square miles.

North Dakota, South Dakota, Montana, and Wyoming are now operated on a maintenance basis and the work remaining in Colorado, Illinois, Indiana, Missouri, Nebraska and Kansas is approaching the maintenance stage. Maintenance work is largely financed by state funds and is designed to keep the territory free of susceptible barberry and mahonia plants. Barberries still exist in many parts of Minnesota, Michigan, Iowa, Ohio, Wisconsin, Pennsylvania, Virginia and West Virginia largely in areas that have been worked initially. Timely rework in these areas is necessary to accomplish complete eradication of this plant pest.

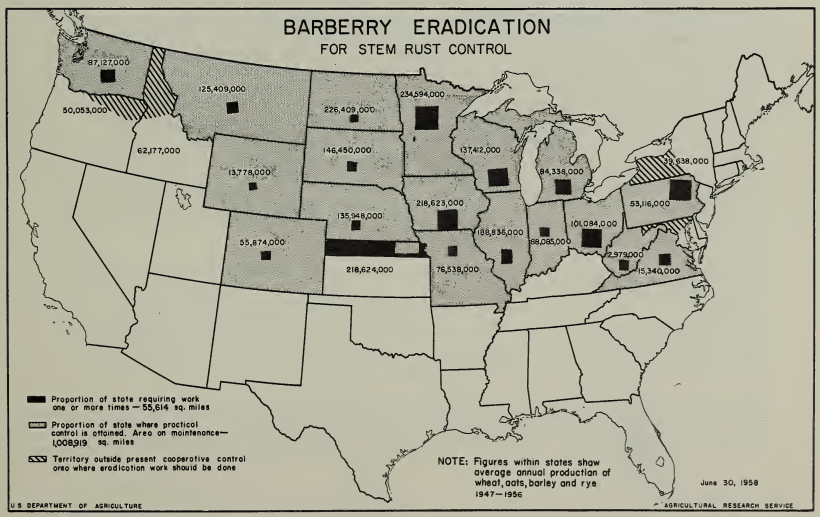
Most Recent Informational Aids:

Publication: Barberry Eradication In Stem Rust Control, Leaflet No. 416, 1957.

Quarantine: Federal and State.

Film: Stem Rust (Color, 16 mm., released 1950, revised 1956, 13 minutes.)

Slides: Series of 17 slides with legends, April 1958. Available for loan.



BURROWING NEMATODE

History: The burrowing nematode (Radopholus similis) was discovered in the Fiji Islands in 1890 and has since been reported from Jamaica, the Hawaiian and Philippine Islands, Formosa, South India, Dutch East Indies, Java, Brazil, Central America, Puerto Rico, and Florida in the U.S.A., on banana and other plants. It is believed to have existed in Florida for at least 30 years where it is now a serious pest of citrus. It has not been found on commercial crops in any other state.

Nature of Pest: The burrowing nematode is a small, parasitic eelworm approximately 1/40-inch long. It lives in roots of trees and other plants. The female deposits eggs inside the rootlets. The eggs develop into larvae which feed on the roots of the hosts. The life cycle is completed in about 30 days. Infestation is spread concentrically about 50 feet each year.

The burrowing nematode stunts citrus and avocado trees. This condition is called "spreading decline." Its symptoms are sparse foliage, undersized leaves, and small fruit. The parasite attacks the roots of citrus and some 115 other species of plants including ornamentals and weeds. The host plants serve as nematode carriers. More than 10,832 acres of citrus involving 2,027 properties in Florida are now known to be affected. Reductions in yields of 50 to 80 percent for grapefruit and 40 to 70 percent for oranges have been reported as resulting from severe infestations of this pest.

Survey, Quarantine and Control: The control program involves: (1) Surveys to delimit areas of infestation; (2) enforcement of state regulatory measures regarding infested nurseries, including supervision of the hot-water treatment of citrus nursery stock; and (3) removal and destruction of infested trees and plants and treatment of soil with fumigant. The Plant Pest Control Division assists the State Plant Board of Florida in: (1) Detection of infestations; (2) supervision of measures regulating movement of nursery stock to prevent spread of the pest and measures to free nurseries of the nematode. In addition, surveys are made to determine if the disease is present in other citrus-growing areas of the country. The containment program carried on by the state calls for the removal of all citrus trees affected, plus four additional rows of adjacent trees outward from the border of infestation, and fumigation of the soil with D-D at 600 pounds per acre.

The Current Situation: During the fiscal year ending June 30, 1958, state-wide surveys and reinspections were made in Florida on a continuous basis to determine where the burrowing nematode was present. Infested areas were delimited and, in the case of groves and nursery properties, maps were prepared showing the exact areas of infestation. These were submitted to the Florida State Plant Board for use in the application of control measures.

Surveys for the burrowing nematode during the fiscal year 1958 were carried out in 20 counties involving 1,203 citrus groves, 1,390 nurseries, and other plant-growing establishments. New infestations

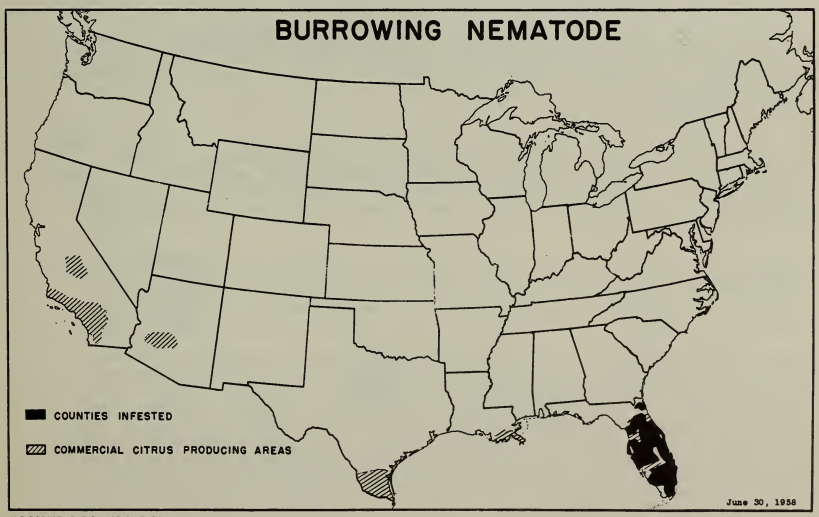
were found in 5 counties which involved 165 citrus groves, 43 citrus nurseries, 33 ornamental nurseries, and 23 miscellaneous properties.

The State Plant Board of Florida has the responsibility of administering control measures for the burrowing nematode. These measures involve the removal of infested trees from citrus groves, hot-water treatment of nursery stock originating from infested citrus nurseries, and the treatment of ornamental nurseries. During the fiscal year the State Plant Board applied control measures to 234 citrus groves and 39 nurseries and greenhouse establishments. A total of 1,468 acres was involved. Approximately 4,184 acres have been cleared of infected trees and fumigated by the State Plant Board since the beginning of the program.

Most Recent Informational Aids:

Quarantine: State.

Slides: Series of 21 2x2 slides with legends, May 1958. Available for loan.



U.S. DEPARTMENT OF AGRICULTURE

CITRUS BLACKFLY

History: The citrus blackfly (Aleurocanthus woglumi) is of Asiatic origin. It was found in the New World at about 1913. In the United States, the first infestation was observed in Florida in 1934 and subsequently eradicated. In 1935 it was found on the west coast of Mexico and from this point it spread rapidly to the east and north toward the citrus-producing areas of Texas, Arizona, and California. It was found in the United States at Brownsville, Texas, on May 31, 1955.

Nature of Pest: The citrus blackfly is not a true fly but is related to scale insects and aphids. The adult is a dark, bluish-colored, four-winged insect about 1/16 of an inch long. The pest spends most of its life in a stationary, scale-like form with its beak imbedded continuously in the citrus leaf tissue almost completely stifling the vitality and productivity of the tree. It can reduce a citrus tree to unproductivity more quickly than any other citrus pest known today. A two-year uncontrolled infestation has been known to cause total crop failure. This insect has caused very severe damage to citrus plantings in Mexico, and it could be equally as destructive and very expensive to control if allowed to become firmly established in the citrus-producing areas of the United States.

Survey, Quarantine and Control: Citrus blackfly surveys have been conducted cooperatively in northern Mexico since 1949 by the Plant Pest Control Division and the Mexican Department of Agriculture. The objective is to locate and eradicate infestations before they become so large that eradication becomes impossible. The Mexican Department of Agriculture applies the control measures and enforces quarantines in the states adjoining the International Border. Excellent results have been achieved in Mexico and many infestations have been eradicated. In Mexico, reinfestations along the Border occur through movement of contraband infested products from states to the south. All newly discovered infestations or reinfestations in the northern Mexico border zone are eradicated immediately by spraying the infested trees. The Mexican National Blackfly Committee is using 180 cc. of 50 percent malathion to 100 lts. of water as the eradication treatment.

In Texas, eradication by the State Department of Agriculture is accomplished by the application of three or more sprays at 21-day intervals. The standard spray formula contains 1-2/3 gallons of light emulsive oil, 1/2 pound chemical containing 5 percent rotenone, and 100 gallons of water. More recently, malathion is being used in many instances as a replacement for the standard spray.

No Federal quarantine against this pest is in effect. Even though all known infestations have been eradicated, others will undoubtedly occur. Recent expansion of transportation facilities in northwest Mexico have greatly increased the hazard of spread through increased travel and movement of products. The pest is of mutual concern to Mexico and the United States.

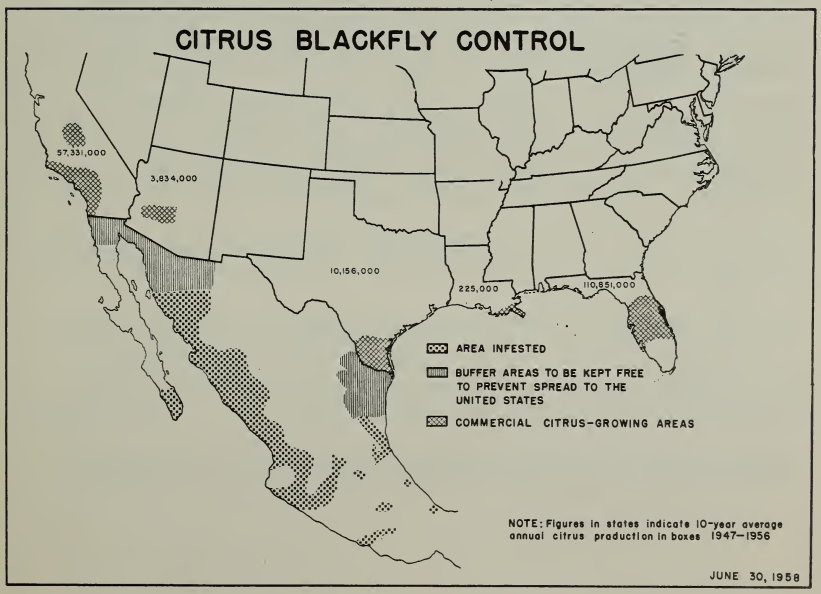
The Current Situation: In the United States, Texas is the only actively participating state in the citrus blackfly work. In that state, no more citrus blackflies have been found following the treatments applied on all infestations found in 1955 and 1956. The last 14 infestations on record were found during July and August of 1956. During the period July 1, 1957, to June 30, 1958, 180,822 trees were inspected on 7,905 properties in Texas. During this same fiscal year ending June 30, 1958, surveys conducted south of the border in Mexico from Sonora east through Tamaulipas, included 1,251,749 trees on 29,930 properties and revealed 527 infested properties with 3,291 infested trees.

The Cooperative Program with the Mexican National Blackfly Committee continues in maintaining the states and portions of states of northern Sonora, Baja California, northern Tamaulipas, and Nuevo Leon free of the citrus blackfly. The area north from Hermosillo, Sonora, to the border is maintained as a blackfly-free area. Infestations found occasionally in this area are immediately treated to eradicate the pest. About 80 miles south of Hermosillo at Guaymas, Sonora, the general infestation has been reduced to the point of effective control by combined parasite release and spray program. In southern Sonora and all of the State of Sinaloa, control by means of parasite releases are generally proving to be effective.

In northern Tamaulipas and the State of Nuevo León, control is by means of insecticidal sprays. Southern Tamaulipas and the states south are under biological control. Work in Mexico is supervised by the Mexican National Blackfly Committee. At points just north of the biological control zones, in the east as well as the west, road stations are maintained by the National Blackfly Committee for the purpose of intercepting plant material which might be carriers of the insect.

Most Recent Informational Aids:

Slides: Series of 10 2x2 slides with legends, December 1957. Available for loan.



EUROPEAN CHAFER

History: The European chafer (Amphimallon majalis) was found for the first time in this country in western New York State in 1940. It is thought to have been brought here earlier with plants from France. It is now known to occur in nine counties in western New York and has been found in one county each in the States of Connecticut and West Virginia.

Nature of Pest: The larvae, or grubs, feed on roots of plants damaging pastures, turf, hay crops, alfalfa, and small grains. The yellowish-brown beetles emerge in a mating flight from the soil at dusk during June and July and "swarm" about trees and shrubs with a buzzing noise, but feed sparingly, if at all.

Survey, Quarantine and Control: Beginning in 1942, the New York State Department of Agriculture and Markets assumed the responsibility for carrying out regulatory procedures governing the movement of products and other carriers from infested areas within that state. Much of the related research has been done by the New York State Experiment Station and other agencies within the state have done much of the survey work.

The program was strengthened in 1955 by promulgation of a Federal quarantine which became effective in September of that year. The Federal regulations apply in parts of western New York and to part of one county in Connecticut and part of one county in West Virginia. Federal funds are used for regulatory work, scouting and control in the infested areas, and for special cooperative surveys in other states. Grub-adult mounts and literature about the chafer have been distributed to all State regulatory officials to aid in the cooperative survey. Soil treatments for eradication purposes have been applied on a Federal-State cooperative basis to all isolated infestations in New York and the known infestations in Connecticut and West Virginia. The cooperating states have made substantial contributions in services and funds for regulatory, survey and control work. The regulated industry has cooperated in the quarantine enforcement program.

Research is under way to improve soil and plant treatments necessary for quarantine compliance. Effort is being given to develop a more effective trap with sex, sound, or light attractants. A more effective trap is especially needed for surveys outside the known infested areas, as well as for determining the degree and extent of spread in the areas under regulation. Cooperative tests to develop improved detection techniques are under way with State-Federal research agencies.

Inspection activity within the Capon Bridge, West Virginia, area during the fiscal year failed to reveal any continuance of European chafer infestation. Suspicious specimens collected in 65 traps set in this area all proved to be negative.

The Current Situation: During the year more than 24 million dollars worth of regulated products moved safely under Federal-State certificate from the infested area. Nursery stock, soil, sand and gravel are the principal products under regulation. Shippers bear the entire cost of fumigation or soil treatment with insecticide under Federal-State supervision. Such treatments are the main basis upon which certificates are issued to permit movement of regulated products from infested areas.

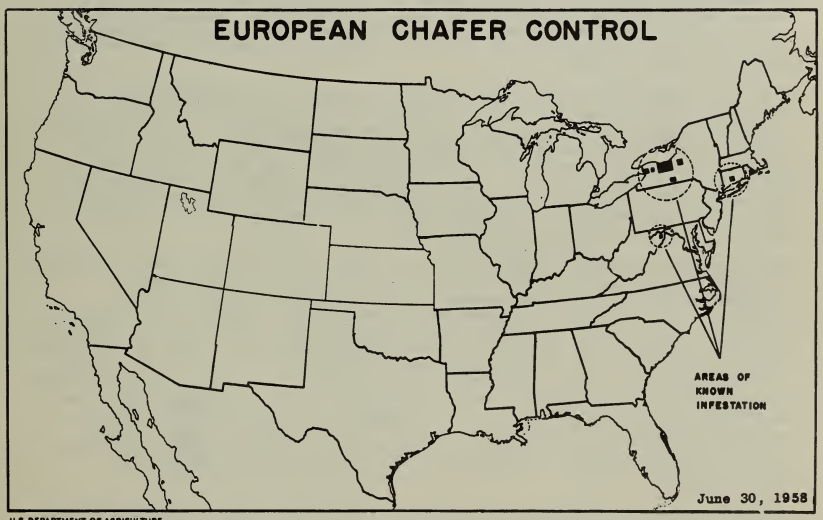
Intensified surveys largely within the regulated area to delimit actually infested properties revealed an additional 80,000 acres to be harboring European chafers. About 2,100 additional acres were found to be infested

beyond the area under Federal quarantine regulation. The development of an effective survey method is a continuing problem. Baited traps showed promise but are not yet adequate. Research on this and other phases of service techniques is being continued.

Since 1955, more than 2,800 acres have been treated with soil insecticide to destroy larvae and adults in nurseries and outlying spotted infestations. No beetles have been found for two or three years in several isolated points of infestations where such treatments were applied including that at Capon Bridge, West Virginia. Additional treatments were applied to the area at Meriden, Connecticut, where there was some extension of the infestation.

Most Recent Informational Aids:

Quarantine: Federal.



U.S. DEPARTMENT OF AGRICULTURE

GOLDEN NEMATODE

History: The golden nematode (Heterodera rostochiensis), a major pest in Europe for many years, was discovered in the United States for the first time in 1941 in Nassau County, Long Island, New York.

Nature of Pest: Eggs and larvae of the golden nematode pass the winter in a thick-walled, protective cyst. In the spring—in the presence of host plants—the eggs hatch and the larvae attack the roots. After penetrating the root the larvae undergo a series of changes, the males moving freely, the females becoming more or less stationary. The female body enlarges and breaks through the outer layer of the root. After fertilization, it continues to enlarge and becomes a protective cyst encasing eggs and larvae of the next generation.

Potatoes and tomatoes are considered as principal hosts of economic importance. This nematode injures the root system and causes stunting and dying of plants and reduced crop yield. On Long Island, nematologists have found potato yields reduced as much as 85 percent on land severely infested with golden nematodes.

Survey, Quarantine and Control: The Plant Pest Control Division in cooperation with the New York State Department of Agriculture and Markets is conducting a program to prevent spread of the nematode from Long Island and to reduce nematode populations on known infested land. In other important potato-growing states, periodic detection surveys are made to determine the presence of the disease.

A New York State quarantine was invoked in 1944. The regulated area includes all of Nassau and Suffolk Counties on Long Island. The Division cooperates with New York State in the enforcement of the provisions of the quarantine. As long as golden nematode continues to be a threat to the potato and tomato industries, survey, quarantine, and control measures in New York State will continue. As infestation is found, the infested land is removed from host-crop production. A search is being made for field fumigation methods which will aid in permitting golden nematode infested land to be returned to potato production.

The Current Situation: The discovery of very few new infestations, despite diligent and extensive inspections, and the low population status of existing infestations demonstrates the effectiveness of the current program. The cooperative Federal-State program has resulted in confining this pest to a relatively small area on Long Island. Fiscal year 1958 field surveys on Long Island added only 6 new properties with a total of 504 acres to the infested area. This is the third consecutive year that the number and extent of new infestations have continued at a low level. Since it was discovered on Long Island in 1941, a total of 13,651 acres have been found infested. Housing and industrial developments by June 30, 1958, have permanently removed 7,733 of these acres from agricultural use. These results are attributed to early quarantine action when the pest was first found, and the immediate retirement of infested land from host-crop production.

Periodic surveys conducted since 1945 in the potato districts of the United States have failed to reveal the presence of golden nematode outside of Long Island, New York. Surveys were conducted in California, Idaho, Oregon, and Washington where 256,868 acres inspected in fiscal year 1958 showed negative results.

Methods improvement work continues in an effort to find possible chemical means of eradicating the golden nematode. In 1956 field-scale tests were inaugurated on three fields in an effort to eradicate the nematode by chemicals. The nematocide was applied at a rate of 900 pounds per acre in two applications of 450 pounds each, 10 days apart. Potatoes were planted on the land each crop year. Laboratory results for the 1957 crop year indicate complete kill of cysts. Better mechanical methods of applying nematocides are being explored. The program has been continued into the 1958 crop year.

Most Recent Informational Aids:

Publications: The Golden Nematode of Potatoes and Tomatoes, U.S.D.A., Leaflet No. 361, May 1954.
The Golden Nematode of Potatoes, Circular No. 875, August 1951.

Quarantine: State.

Film: The Golden Nematode (Color, approximately 27 minutes, produced by Cornell University.)

Slides: Series of 16 2x2 slides, February 1958. Available for loan.

GRASSHOPPERS

History: Grasshoppers are native to the United States and are generally distributed throughout all states. The most severe outbreaks occur in the midwestern and western states. The first well-organized grasshopper control program involving Federal participation was initiated in cropland areas in the midwestern states in 1934.

Nature of Pest: Most species of grasshoppers hatch during the spring months from eggs deposited in the ground the previous season. The nymphs develop into adults during the summer. The adults deposit their eggs in the summer and fall, and then die. These pests feed on a wide variety of host material including forbs, cultivated crops, and range grasses. Under outbreak conditions grasshoppers frequently destroy all of the vegetation in an infested area. In many cases even light populations cause severe damage. The Bozeman Laboratory of the Agricultural Research Service, Division of Entomology Research, has estimated that the average annual loss to crops and range forage combined in the 17 states west of the Mississippi River approximates $90,000,000.

Survey and Control: The immediate objective of the control program is to destroy infestations of grasshoppers before they seriously damage current season's planted and range crops. Division personnel provide technical leadership and direction in evaluating the problem, planning and executing control, and determining results. The work falls into four main categories: (1) Continuing annual surveys to locate and evaluate infestations; (2) participation in control of infestations on roadsides, idle-lands and rangelands, particularly when migratory species are involved and there is danger of spread over wide areas and when local facilities are inadequate to handle the problem; (3) control on Federally-owned land in cooperation with Federal land-managing agencies; and (4) provision of technical assistance and program services to farmers who finance local control on croplands. Control is now achieved through the use of insecticide sprays applied with ground or aerial equipment. Aldrin and heptachlor, 2 ounces in one gallon of diesel fuel oil applied to the acre, provide effective control.

This work is cooperative. The States, counties, landowners, other Federal agencies, and the Plant Pest Control Division each participate financially in the program. Treatment applications are made by contract aircraft and in some cases Federally-owned ground equipment.

The Current Situation: Cooperative grasshopper surveys completed in the fall of 1957 indicated heavy populations of grasshoppers could be expected on 18,686,492 acres of rangeland in 17 western and midwestern states in 1958. Most infestations were composed of the typical range-land species complex. In the five state area—Colorado, Kansas, Oklahoma, New Mexico, and Texas—flights of the migratory grasshopper were recorded during the late fall. A warm, late fall prolonged the egglaying period for this species and set the stage for the 1958 outbreak. Spring weather favored maximum survival of the newly hatched nymphs. Because of this, many of the areas with a relatively low potential in 1957 developed economic infestations in 1958. In Montana where a serious infestation was expected, a wet, cold spring over a prolonged period relieved the situation.

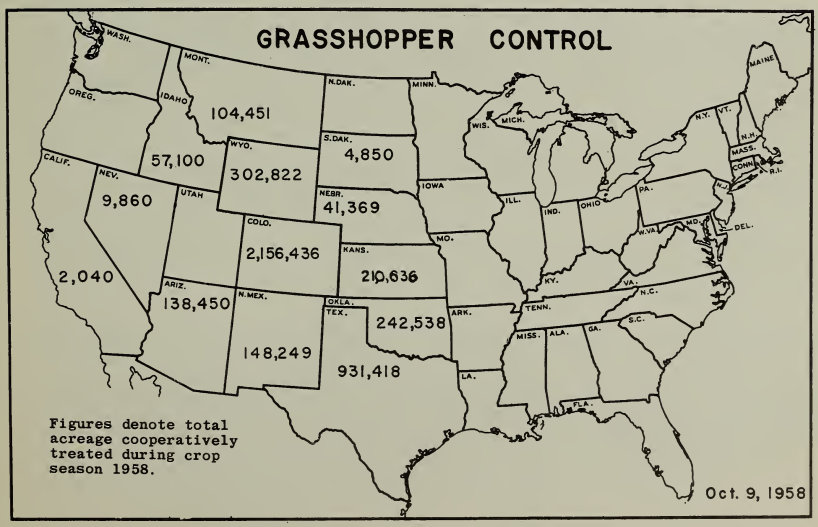
During the 1958 season 4,338,329 acres of range, roadside, idle-land and wasteland were treated in a Federal-State cooperative control program in 13 western states. This contrasts with 1,738,651 acres treated in 1957. In Colorado 2,156,436 acres were treated; in Texas 931,418 acres; Oklahoma 242,538; Kansas 210,636 acres; and Wyoming 292,206 acres. Smaller acreages were treated in Arizona, California, Idaho, Montana, Nebraska, New Mexico, Nevada, and South Dakota. To support the rangeland programs Federal assistance was provided to the states to treat heavily infested roadsides where grasshoppers threatened adjacent crops and rangeland. As the reporting year drew to a close, grasshoppers in Wyoming were present in above normal numbers over widespread rangeland areas with development ahead of normal and damage becoming increasingly apparent in many areas.

Most Recent Informational Aids:

Publication: Grasshoppers, A New Look at an Ancient Enemy, U. S. Department of Agriculture, Farmers Bulletin No. 2064, revised May 1957.

Film: Grasshoppers Can Be Controlled. (Color, released 1955, 21-1/2 minutes.)

Slides: Series of 22 2x2 color slides. Available for loan.



GYPSY MOTH

History: The gypsy moth (Porthetria dispar), a native of southern Europe, Asia, and North Africa, was introduced into Massachusetts from Europe about 1869. The generally infested area now includes New England and eastern New York, northeastern Pennsylvania, and northern New Jersey. The presently known infested area represents less than 3 percent of the total area of the United States. All known infestations in Michigan, New Jersey, and Pennsylvania have been treated.

Nature of Pest: The adult female moth deposits about 400 eggs in a single cluster in July or early August. The insect overwinters in the egg stage. Hatching occurs in early May. The caterpillars, which are voracious feeders, inflict severe damage by defoliating trees and shrubs. After attaining full growth by mid-June, the caterpillars change into pupae and, about two weeks later, adult moths emerge. The male moth is a strong flyer but the female is incapable of flight and dies soon after deposition of eggs. The adult moths take no food.

This moth is a serious pest of deciduous trees and shrubs and evergreens are attacked under outbreak conditions. When such conditions develop, caterpillar feeding results in defoliation of extensive forest areas—retarding tree growth, even resulting in death of the trees where subjected to repeated attacks, with hemlock usually dying after one defoliation. Trees weakened by defoliation also become susceptible to diseases and attacks by other insects, especially bark borers. The greatest potential for economic loss lies in uninfested areas west and south of the presently infested region. More than 100 million acres of susceptible hardwood forests are present in these areas vulnerable to invasion if protective measures fail.

Quarantine and Eradication Program: Eradication of this pest is the long-range objective. Attainment of the goal will be reached through the enforcement of Federal and state quarantines, surveys to detect new infestations, application of treatments to eradicate outlying and peripheral infestations, and technical assistance to states. Interstate movement of forest and quarry products and other commodities which constitute a hazard of spread is regulated under Federal Quarantine No. 45 and intrastate movement under applicable State quarantines, orders and regulations. The gypsy moth and brown-tail moth quarantine was revised and related administrative instructions designating regulated areas issued effective July 20, 1956. The latter placed under regulation additional areas in New York and Vermont found infested in 1955-1956. The Federally-regulated area is divided into "generally infested" and "suppressive" areas by an amendment of the quarantine dated March 21, 1957. The quarantine provides for the shipment of certain regulated articles from establishments issued a Certificate of Exemption when shown free of infestations following inspection or the application of approved insecticides.

A suppressive area consisting of approximately 5,963 square miles in New York State, roughly comprising the area treated in New York in 1956-1957, is being retained under regulation until there is positive assurance that the gypsy moth no longer exists there. A total of about 63,357 square miles of land is under Federal regulation in New England and eastern New York. Nine hundred square miles in Pennsylvania and 491 square miles in New Jersey are under State regulation.

Westward spread of the insect was slow between 1923 and 1948 when intensification of control work confined the western periphery of the generally infested area to the western edge of New England. Following the hurricane of 1938, infestations were found scattered throughout eastern New York and evidence is strong that broken fragments of egg masses were carried there by the winds. This extensive spread was followed by the worst gypsy moth outbreak on record, occurring in 1952 to 1954. Further spread took place as a result of wind dispersal of small larvae in a westerly direction. In 1954 an infestation was found at Lansing, Michigan. Since then surveys have been made in Michigan each year and eradication measures taken when necessary.

Sex-attractant traps are now used extensively in current survey operations for determining distribution of the pest and for checking efficacy of control operations. Outlying and peripheral infestations are treated by aircraft using DDT at the eradication dosage of one pound in one gallon of diluent per acre. Outbreak conditions within the generally infested region are brought under control with even lighter treatments of DDT. The supply of natural sex-attractant is becoming difficult to acquire in amounts necessary for the annual trapping programs. In an effort to relieve this situation, research is directed toward finding a suitable synthetic. Plans call for testing 18 synthetics that have shown promise in the past, and new materials consisting of botanical extracts, fractions of the natural attractant, and several hundred other synthetics.

In a continuing effort to improve methods for gypsy moth eradication some 40 chemical compounds were laboratory tested this year and the most promising of these were subjected to field plot tests. Those that proved most effective were checked for persistence on forage and pasture grass, for residue in milk, and for toxicity to fish. It would appear that of those tested at least two will be useful for gypsy moth work.

Program operations are conducted in cooperation with pest control agencies of the states involved. Survey and control activities undertaken in all areas are made under authority of applicable plant pest laws of the states involved.

The Current Situation: In the generally infested area of New England and New York recent surveys reveal unusually low gypsy moth populations. Surveys in the summer of 1957 showed only 6,458 acres defoliated, and there was less in 1958. This sharp decline in infestation is attributed to natural enemies, severe winter temperatures, late frost, and other factors which caused heavy egg mortality, together with spraying operations. The eradication program during 1958 involved the aerial treatment of 495,000 acres in Pennsylvania. In New York two small isolated infestations on Long Island and other isolated spots in the suppressive area of that state were treated with ground equipment. Also 2,305 acres of heavily infested woodlands were treated by the New York State Conservation Department. State and local agencies applied treatment to 10,808 acres in Connecticut, and a State agency treated 9,700 acres in Massachusetts. Small acreages were also treated in Maine and Rhode Island. Altogether, 534,576 acres received treatment by Federal and other agencies.

The eradication program in New York State was temporarily halted in 1958 so that the 1957 work could be fully evaluated and any required "mopping up" could be done; however, during the eradication season tests were made of several alternate insecticides more suitable than DDT for use on pasture and forage crops. Those that showed promise under laboratory and field conditions were subjected to tests by animal feeding experiments.

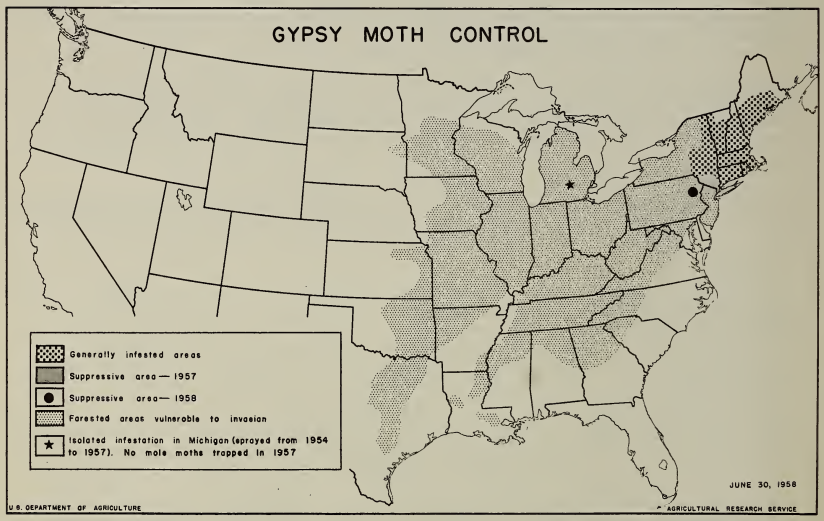
Most Recent Informational Aids:

Publication: The Gypsy Moth, PA 285, U. S. Department of Agriculture. (February 1956)

Quarantine: Federal and State.

Film: Gypsy Moth (Color, released 1953, 28 minutes.)

Slides: Series of 24 2x2 slides with legends, February 1958. Available for loan.



HALL SCALE

History: Common throughout the Middle East, Hall scale (Nilotaspis halli) was first found in the Western Hemisphere in 1934 infesting stone fruits in the experimental plantings of the U. S. Plant Introduction Garden, Chico, California. The hosts on which the scale has been found in this country are limited to the genera Prunus and Amygdalus, and the shrub Spireae veitchii. The preferred hosts include almonds, peaches, nectarines, plums, and prunes. It appears to have been introduced into California about 1911 or 1912 from Chinese or Russian Turkestan. Immediately following discovery, the California Department of Agriculture eradicated the infestation but the scale was again found in the Garden in 1940 and from there it spread to a nearby, large commercial orchard. The State of California then joined forces with the United States Department of Agriculture to form a cooperative project of eradication. Subsequently extensive surveys made in California, other western and Gulf Coast states revealed eight localized infestations centering in the vicinity of Chico, Oroville, and Davis, California.

Nature of Pest: Little is known of this very prolific diaspid scale. It is so small that 2,000 individual specimens have been found on a single almond hull. One and a partial second generation occur between the time the first crawlers emerge in late March and the middle of October when the scale is found on all parts of the host. The scale enters into the deep bark fissures of the tree, damaging current growth and malforming fruit. Up to 25 percent loss of fruit may result. If this pest were to become established in California some 385,000 acres of deciduous stone fruit valued at more than $228,000,000 would be subject to infestation. Spread from California would endanger thousands of acres of stone fruit throughout the country.

Survey, Quarantine and Control: The objective of the program—to locate and eradicate Hall scale from all existing infestations—is being realized by the enforcement of State regulations regarding the movement of plant material, by survey of host-growing areas, and fumigation or removal of infested trees. Eradication is accomplished by three consecutive fumigations with hydrocyanic acid gas.

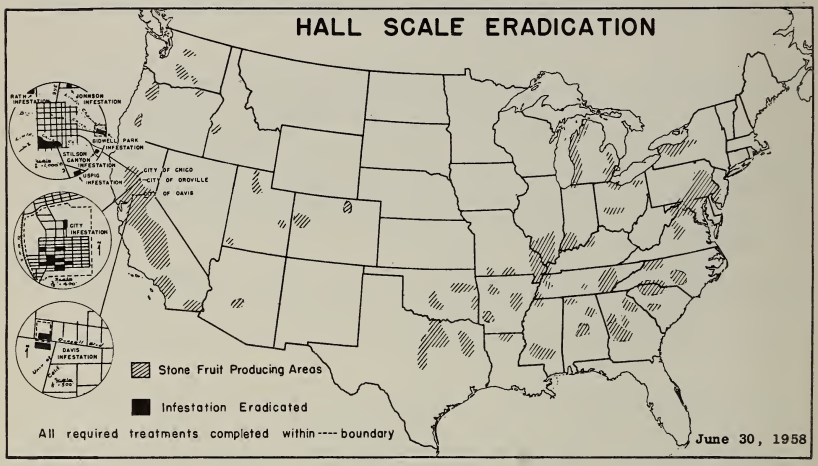
The Current Situation: With the completion of the last scheduled fumigation in the fall of 1957, all known infestations in the country are considered eradicated. Following the last infestation found in 1956, continuous delimiting surveys have not revealed any infestations in Butte and Yolo Counties, California. Inspections were made in and near the city of Chico, on and adjacent to the U. S. Plant Introduction Garden, and in Oroville. In May inspections were made on locations in Arkansas, Florida, North Carolina, South Carolina, Tennessee, and Oklahoma where host materials were once shipped from the infested area. Inspections also included the U. S. Plant Introduction Garden at Coconut Grove, Florida. Results were negative.

In fiscal year 1958, 48,222 host plants were inspected on 755 properties in 56 city blocks; 88 host plants were removed; and 1,761 trees were fumigated with HCN. Surveys are continuing in the immediate vicinity of treated infestations. These delimiting surveys will continue throughout the fiscal year 1959 and, if no further infestation is found, the program should be brought to a successful conclusion by the end of 1960. The eradication program over a period of 18 years required the inspection of 974,604 hosts and the fumigation or destruction of 48,946.

Most Recent Informational Aids:

Publication: The Hall Scale Eradication Project, Circular No. 920, September 1953.

Slides: Series of 11 2x2 slides. Available for loan.



IMPORTED FIRE ANT

History: The imported fire ant (Solenopsis saevissima richteri), a native of South America, is believed to have entered this country with cargo through the Port of Mobile, Alabama, about 1918. Gradually it spread to an area adjacent to the City of Mobile and by 1940 infestation appeared in areas west to Mississippi and east to Florida. The spread continued and by 1957 it was reported in nine southern states. This pest has spread at an alarming rate by flying, crawling, drifting on logs, accidental moving on crops or nursery stock, and by other carriers.

In the calendar year 1957, Congress authorized a joint Federal-State imported fire ant eradication program. On October 15, 1957, the Southern Plant Board—represented by the States of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, South Carolina, Tennessee and Texas—met at Memphis, Tennessee, with representatives from the Agricultural Research Service to consider the most effective means of attacking the problem. The following objectives were established: (1) Preventing further spread of the fire ant by application of regulatory procedures; (2) location and prompt eradication of outlying infestations; and (3) development of jointly-financed county or area-wide eradication programs in areas where infestation is general. The group urged the early adoption of a Federal quarantine. Messrs. B. P. Livingston of Alabama and R. P. Colmer of Mississippi were appointed by the chairman to represent the Board in working with Federal people in drafting proposed regulations. A public hearing to consider quarantine action was held November 19, 1957, in Memphis, Tennessee. The plan of operations was concurred in by the Southern Commission of Agriculture at a meeting at Memphis, Tennessee, during the first week in December. A Federal quarantine became effective May 6, 1958. Following a review of the literature and consultation with research entomologists, the States and the Federal agencies agreed on the use of heptachlor and dieldrin, 2 lbs. actual chemical to the acre, as the eradication treatment.

First consideration is being given to areas of incipient or sporadic infestations. These infestations are defined as those occurring in counties where infestation is "spotted" and only limited acreage will require treatment. Effort will be directed toward treating all areas falling in this category during the coming fiscal year. Within generally infested areas, progressive eradication programs are being undertaken on a county or parish basis and planned in such a way as to extend over a period of two or more years, depending upon the acreage involved and the availability of funds and facilities necessary to get the job done. State Fire Ant Advisory Committees have organized in each state. Membership includes representatives from various segments of agriculture and conservation. These committees include, but are not necessarily limited to, representatives of the Extension Service, Experiment Station, Fish and Wildlife Service, and Farm Bureau. Local committees likewise have been established in counties or parishes undertaking eradication programs. Local committee membership consists of, but is not limited to, the County Agricultural Agent and representatives of other principal agricultural agencies in the county together with a member of the local county governing board. These local committees arrange for and are responsible for local participation, assist in the development of plans of operation, share responsibility in conducting the program, develop local publicity and contacts necessary to the orderly accomplishment of the work, and act as the local clearing houses for information.

Federal funds are used to share the cost of all jointly approved Federal-State-County fire ant programs. Local support is interpreted to include, but may not be limited to, funds provided at county or local levels, the employment of men paid from other than Federal or State sources, and furnishing of equipment and materials useful to the orderly accomplishment of an organized program. Counties or parishes with a major fire ant problem are encouraged to engage a full-time man to assist with the planning and direction of the local program.

As a part of the cooperative action, the chairman of the Southern Plant Board appointed a committee of research chaired by Dr. Ross E. Hutchins to work with the control units in the selection of materials to be used under the various conditions.

Nature of Pest: The imported fire ant is a destructive and annoying pest. It damages crops, attacks and injures young, unprotected animals and birds, and its bite and painful sting are harmful to humans. It interferes with harvesting and other hand labor in fields of forage and cultivated crops. The hard-crusted mounds that it builds damage or prevent the use of machinery for cultivating, harvesting, and mowing. Land severely infested by the fire ant results in loss of ground cover and depreciates the value of the land. Serious damage occurs to many vegetable crops by the imported fire ant feeding on the young, succulent plants. The pest also is known to attack newly hatched birds such as quail. Brooding hens are often forced off their nests and their young chicks destroyed by the ants. Conservationists, sportsmen, and poultrymen are all concerned when the imported fire ant infests an area.

The worker ant is 1/8- to 1/4-inch long and is blackish-red to reddish-brown, is wingless, and usually sterile. The other two adult forms are the winged females or queens which lay eggs, and winged males which mate with the queens. An ant colony begins when the queen, after mating, digs an underground chamber and starts laying her eggs. This chamber is the start of the mound. First she lays clusters of 10 to 15 eggs but later increases her output, laying hundreds of eggs. The life cycle of the ant covers a period of 25 to 40 days, depending on conditions. Eggs hatch into larvae in 8 to 12 days; larvae change to pupae in 6 to 12 days; adults emerge from pupae in 9 to 16 days. As many as 50 to 75 mounds or more per acre frequently occur. These mounds are normally about a foot high and two feet across, probably contain an average of 25,000 ants, and are most common in areas such as pastures, parks, lawns, meadows, and cultivated fields. The pest adapts to many types of soil, varying from sandy and marshy lands to the rich river-valley soils. Open, sunny sites in pastures or uncultivated areas and abandoned fields are preferred; however, cultivated fields also become infested to the extent of interfering with harvesting of crops like corn, cabbage, and potatoes because workers often refuse to go into severely infested areas because of the bite and sting of the pest. It is not normally found in wooded areas except along roads or in other open areas.

Quarantine and Control: Historically, the first large-scale control effort pertaining to this pest was made in 1937 in Alabama using cyanogas. Mississippi initiated an extensive control program in 1948, obtaining good results with a 5 percent chlordane dust. Research to gain information on the biology, control, distribution, and economic importance of the pest was begun in 1949 in Alabama. Joint Federal-State surveys to determine the distribution of the imported fire ant were made from 1949 to 1953. The pest was found to infest 102 counties in 10 states. At first it was believed that the infestations could be eliminated on an individual property

owner basis. After many appeals were made from imported fire ant infested states for Federal assistance, Congress in 1957 authorized the United States Department of Agriculture to join interested states in a control program.

Federal Quarantine 301.81 applicable to the States of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas became effective May 6, 1958. Its purpose is to prevent the spread of this pest from states where it is known to occur. The regulations provide methods whereby most host material and other carriers may be inspected or treated or otherwise made eligible for interstate movement from the regulated area.

The Current Situation: Although some delays and difficulties were encountered in the early stages of this program, substantial progress is now being made. Initial organization of State and local committees required time. Early attention was devoted also to the treatment of commercial nurseries. However by June 30, 1958, 437,014 acres had been treated in 9 states under the cooperative eradication program and by individual property owners—Alabama 149,609; Arkansas 18,578; Georgia 107,462; Louisiana 136,534; and South Carolina 5,065. Florida treated 8,193 acres; Mississippi 6,020 and Texas 4,586; these states were delayed in starting their programs. The entire known infestation in North Carolina, 967 acres, has been treated. Outlying infestations in all states were given first attention to prevent further spread in the peripheral area. More than 50 of these were treated completely.

Where imported fire ant infestations are heavy and extensive, treating the entire soil surface of an area has been found to be more effective than individual mound treatments. However in small, lightly infested areas, each mound and a suitable margin around it may be treated, provided program officials feel eradication will be accomplished by this method.

The method of application depends largely upon land use and size of the block to be treated. Aircraft, motorized ground equipment, and hand applicators are used as the situation dictates. In this cooperative program, wide use is being made of dieldrin and heptachlor in dry, granular form, applied at the rate of two pounds to the acre. Normally, only a single application of insecticide is needed although there will be instances where "spot" treatment may prove to be necessary.

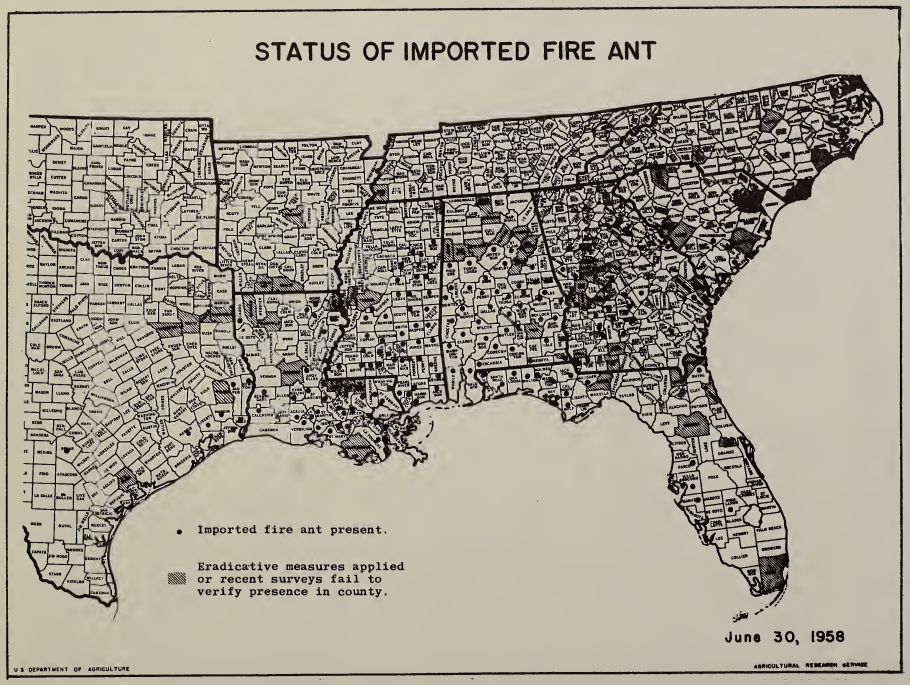
A methods improvement unit has been established at Gulfport, Mississippi, to service the eradication program. Insecticides are being screened and field tests made to evaluate various insecticide formulations for both area and individual mound treatments. Studies are under way on the nutrition, food preferences, and feeding habits of the imported fire ant with the objective of finding a lure or bait treatment that can be used in the eradication program.

Most Recent Informational Aids:

Publications: The Imported Fire Ant - How To Control It, U. S. Department of Agriculture Leaflet No. 350, 1954.
The Fight Against The Imported Fire Ant, U. S. Department of Agriculture Program Aid No. 368. (Aug. '58)

Quarantine: Federal.

Slides: Series of 32 2x2 slides with legends. November 1957. Available for loan.


STATUS OF IMPORTED FIRE ANT
Imported fire ant present.
Eradicative measures applied or recent surveys fail to verify presence in county.
June 30, 1958
U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE

JAPANESE BEETLE

History: The Japanese beetle (*Popillia japonica*) is of oriental origin and was brought to New Jersey with plants from Japan prior to 1916. It is now found in parts of coastal and adjacent states from Maine to Georgia with some spotted infestations outside this area as far west as Iowa and Missouri.

Nature of Pest: The beetle lives in the soil as a grub for about 10 months. The adult, which emerges in early summer, is approximately one-half inch long, of a brilliant metallic green or bronze color with coppery-brown wing covers. The abdomen is marked by a row of white spots along the sides with two prominent white spots near the tip. The female beetle deposits her eggs in the soil. Adults are most numerous in July and disappear by September.

The adult, which lives about 30 days, feeds on and skeletonizes the leaves of grapes, peaches, apples, berries, soybeans, ornamentals, and other plants. The root-feeding grub is responsible for extensive damage to turf in pastures, lawns, and golf courses. In all, this pest attacks more than 200 agricultural and ornamental plants, causing damage of around $10 million annually.

Survey, Quarantine and Control: When firmly established within a community, control of the Japanese beetle by insecticides or biological controls is a slow, difficult, and costly process. For this reason Federal-State regulatory and control programs are in effect to protect uninfested areas. In force since 1919, the Federal quarantine provides procedures for the interstate movement of commodities with a minimum of interference to regulated commerce and the public. The regulations now apply to the areas outlined on the accompanying map. A limited amount of control is done each year in support of the quarantine. The operation of this cooperative program under Federal leadership, combined with Federal and State research, seeks to provide better methods for controlling this pest.

The Current Situation: The infestation is general throughout the area outlined on the accompanying map. The program in the eastern part of the country involves principally regulatory activities aimed at prevention of spread of the insect to noninfested areas. The regulations of the summer quarantine have been revised so that they may be applied to the movement of any product or to any carrier in any portion of the regulated area when the adult Japanese beetle population is found heavy enough to warrant such action in that particular location.

Increased emphasis has been placed on survey for the beetle outside the area under Federal regulation with the objectives of discovering any additional areas that may need to be placed under State or Federal quarantine and to determine the need for control or eradication measures in certain areas. Survey of previously known infestations in Georgia, Illinois, Indiana, Kentucky, Ohio, South Carolina, and Tennessee has revealed a number of expanded or new infestations. Nearly 160,000 infested acres have been found in Georgia, the largest areas being at Atlanta and Dahlonega. Extension of infestation has been found at Cincinnati, Ohio, and South Bend, Indiana. Important infestations are known at Kentland, Indiana, and Sheldon, Illinois. About 100,000 to 150,000 infested acres have been observed in northwestern South Carolina. Several relatively new infestations have been noted in eastern Tennessee; Pike County, Kentucky; Lafayette and Hammond, Indiana; and at Chicago and Peoria, Illinois.

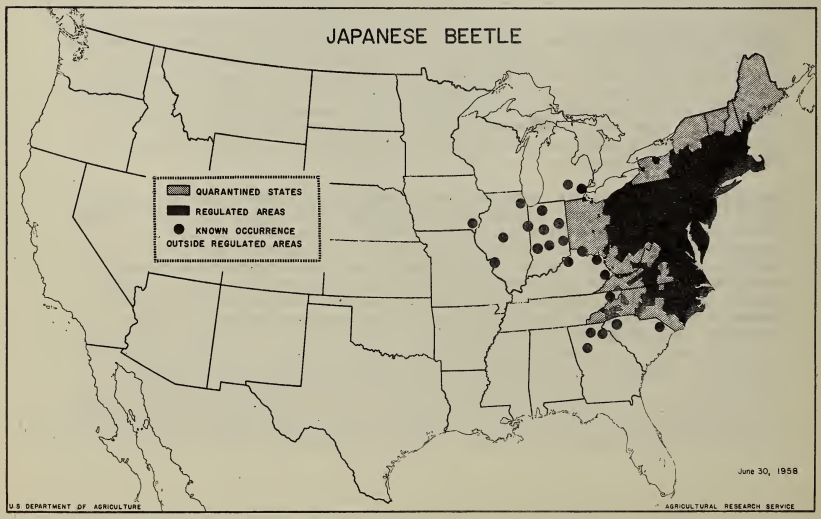
A study is under way to determine the importance of aircraft, truck, and rail traffic in spreading adult beetles. The present quarantine regulations based on studies of several years ago require treatment of these means of transportation moving from infested, regulated areas during the adult season when a hazard of spread exists.

Year-round regulation of soil and plants to prevent spread of the soil-inhabiting forms of the Japanese beetle from the quarantined area was applied to 973 shippers who move products valued at nearly $37 million annually.

During the spring of 1958 three important outlying infestations were treated, principally by aircraft, with two pounds of dieldrin per acre in granular formulation. These were at Fort Madison, Iowa, 2,000 acres; East St. Louis, Illinois, 4,000 acres; and Sheldon, Illinois, 8,195 acres. Treatment in the Sheldon location was applied in a one-half mile band around the perimeter of the infestation in an effort to halt outward spread. An additional 6,918 acres were soil treated and 3,325 foliage treated in several other states, mostly in support of regulatory operations.

Most Recent Informational Aids:

Publication:	Controlling the Japanese Beetle, Farmers Bulletin No. 2004, U. S. Department of Agriculture, March 1958.
Quarantine:	Federal and State.
Film:	The Japanese Beetle (Color; released 1957, 13½ min.)
Slides:	Series of 15 2x2 slides with legends. February 1958. Available for loan.



KHAPRA BEETLE

History: The khapra beetle (Trogoderma granarium), first described in 1898, is a native of India, Ceylon, and Malaya where it is considered the most serious of all storage pests. It is now known to occur in England, Korea, Germany, Egypt, and other European, African, and Asiatic countries.

The discovery of a khapra beetle infested warehouse at Alpaugh, Tulare County, California, on November 10, 1953, represented the first known occurrence of this insect in the Western Hemisphere; however, there is evidence that the beetle may have been present in a warehouse at Fresno, California, as early as 1946. Used, infested burlap bags transported from the Fresno warehouse to Alpaugh may account for the infestation found at Alpaugh. It was found infesting stored grain in Phoenix, Arizona, in January of 1954, and in April of that year specimens were recovered on sacked seed in New Mexico. Also, khapra beetles were collected from a warehouse in Mexicali, Baja California, Mexico, in 1954.

Nature of Pest: The life cycle of the khapra beetle is completed in from 35 to 100 days, depending on temperature. Temperatures from 85° to 90° F. are optimum yet the larvae have been known to withstand temperatures of 14° F. for short periods of time, and the upper level is considered to be about 115° F. There are five molts in the development of the larvae and the cast skin is shed following each molt. The female lays an average of 120 eggs. The adults live but a short time and apparently do not feed.

Grain damage, depending upon existing conditions, varies from 5 to 30 percent and damage up to 75 percent has been reported. In this country it has been found in oats, wheat, corn, beans, nuts, alfalfa seed, castor beans, cottonseed, and other food products. Preferred processed materials include cornmeal, rolled oats, flour, breakfast cereals, crackers, dog biscuits, powdered milk, raisins, and nut meats. Bulk grain under extended storage presents the most favorable conditions for beetle multiplication and subsequent damage.

Control: Because of the habit of the larvae of concealing themselves in crevices and cracks and living for extended periods without food, nothing short of a penetrating fumigant provides effective eradication. Methyl bromide is applied to structures covered with gastight tarpaulins. The fumigant is applied at the rate of 5 pounds per 1,000 cubic feet for an exposure period of 48 hours. Concentrations of the fumigation gas in the building must be maintained at 32 ounces or above for at least 24 hours of the exposure period.

The Current Situation: During the fiscal year ended June 30, 1958, 22,296 properties were given initial inspection and 30,517 sites were reinspected in 32 states and the Republic of Mexico. Of the sites inspected, 105 were found to be infested, involving buildings with a volume of 13,398,334 cubic feet. Seven of these properties were reinfestations. Fumigation treatment was applied to 113 properties comprising 14,422,880 cubic feet. The khapra beetle has not been found outside of Arizona, California, New Mexico, and two states of the Republic of Mexico.

The following table reflects the work accomplished since the initiation of the program in 1955.

	Infested		Treated		Remaining	
	No. Prop.	Cu. Ft.	No. Prop.	Cu. Ft.	No. Prop.	Cu. Ft.
Arizona	201	52,793,348	198	52,368,447	3	424,901
California	330	80,458,680	327	79,993,680	3	465,000
New Mexico	6	440,920	6	440,920	-	-
Rep. of Mexico	73	15,110,230	71	14,980,651	2	129,579
Total	610	148,803,178	602	147,783,698	8	1,019,480

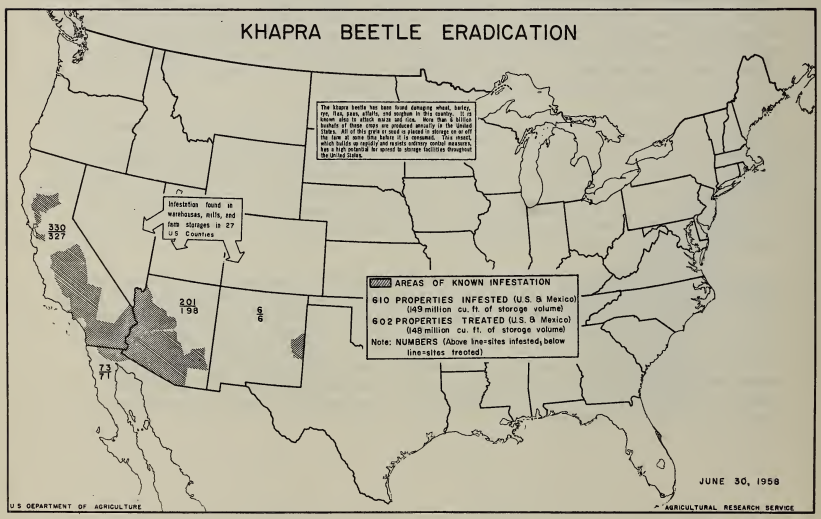
Most Recent Informational Aids:

Publications: The Khapra Beetle—A Situation Report, ARS 22-17, August 1955, U. S. Department of Agriculture.

Have You Seen This In Your Grain, PA-261, January 1955, U. S. Department of Agriculture.

Film: Eradicating The Khapra Beetle, (Color, September 1957, 13-1/2 minutes.)

Slides: Series of 18 2x2 slides with legends, December 1957. Available for loan.



MEDITERRANEAN FRUIT FLY

History: The Mediterranean fruit fly (Ceratitis capitata) is a native of the Mediterranean area. It has been reported in Europe, Asia, Africa, South America, Central America, and the State of Florida in the United States. The first infestation in the United States was found in Florida in 1929 and involved 20 counties in the central part of the state. It was eradicated by the latter part of 1930 at a cost of about $7,500,000. It was not observed again in the United States until April 13, 1956, when it was found established at Miami Shores, Florida.

The importance of this pest is indicated by its record in other countries. In Greece as much as half of the citrus crop has been lost in some years because of this insect. In Sardinia in 1950, 30 percent of the peach crop was lost and apple, pear, and orange crops were seriously damaged. In areas of Africa and South America, the pest has made commercial fruit production difficult, if not impossible. In addition to jeopardizing the multimillion dollar value of the Florida citrus crop it is possible that, if let go, the entire fruit and vegetable industry in the Gulf coast states and California would be seriously threatened.

Nature of Pest: The Mediterranean fruit fly produces about 10 generations a year in Florida. It has four life stages—adult (fly), egg, larva (maggot), and pupa. The adult is a little smaller than a house fly. Its body is yellow, tinged with brown; it usually lives 30 to 60 days and is a strong flier.

The female adult pierces the skin of a host fruit with its needlelike ovipositor and then deposits 1 to 10 eggs in the puncture. This same egg puncture may be used by other Mediterranean fruit flies; several hundred eggs have been found in a single cavity. When conditions are favorable, female flies probably lay an average of about 300 eggs during a lifetime. The eggs hatch into larvae in 2 to 4 days. When mature, the larva leaves the fruit and enters the soil by dropping to the ground from the fruit on the trees; usually the fruit has dropped to the ground by the time the larva is mature. In the soil it rapidly passes through the pupa stage and emerges from the soil as a fly in 8 to 14 days. In about seven to nine days after emergence the flies mate, the female lays eggs, and the life cycle begins again.

Quarantine and Control: Federal and State quarantine regulations to prevent the spread of the Mediterranean fruit fly to uninfested areas were put into effect promptly after the discovery of the 1956 infestations and were continued until eradication of the fly permitted relaxation of the regulations. All counties under Federal quarantine were removed from regulation in May 1958. Counties under State regulations were removed shortly thereafter. A recently perfected bait treatment applied to vegetation by airplanes and ground sprayers was one of the main weapons used in the fight against the adult fruit fly. It contained both an insecticide (malathion 25 percent wettable powder) and an attractant (enzymatic protein hydrolysate or sauce base). Because flies seek out the poison bait, complete coverage of each tree or plant for effective application is not necessary.

The treatment was applied at the rate of one pound of protein hydrolysate (one quart of sauce base) and 2 to 3 pounds of malathion 25 percent wettable powder mixed with one gallon or more water per acre. It is applied uniformly over the infested area as a coarse spray at intervals of 10 to 14 days. The length of time allowed between applications depended on the frequency and intensity of rain and on other climatic conditions.

The Current Situation: The last Mediterranean fruit flies were trapped in Florida November 26, 1957. Trapping has continued with 32,715 traps still being operated in Florida. To check other possible entrance points 32 combination Mediterranean fruit fly-melon fly traps are operated in Georgia at all known points from which overseas shipments are received; 106 traps in the New Orleans district; 50 traps in George, Hancock, Harrison, and Jackson Counties, Mississippi; and 25 traps baited with the combination lure in Cameron County, Texas.

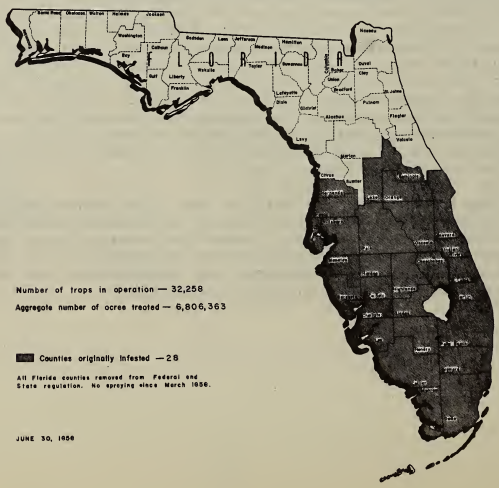
The last aerial application of bait treatment was applied on Snead's Island, Manatee County, Florida, February 25, 1958. This marked the first time since aerial applications were started in 1956 that such treatments could be brought to a halt because of lack of continued infestation. As an added precaution, two additional ground treatment applications were applied subsequently at weekly intervals at the focal point of the last infestation. An aggregate of about 7 million acres required treatment to effect this apparent eradication. As of June 30, 1958, it appears that the Mediterranean fruit fly has once again been eradicated from the United States. Trapping and surveys will continue indefinitely to be certain this goal has been reached.

Most Recent Informational Aids:

Publication:	The Mediterranean Fruit Fly, PA No. 301, U. S. Department of Agriculture, December 1956.
Quarantine:	Federal and State.
Slides:	Series of 32 2x2 slides. Available for loan.
Film:	The Rise and Fall of the Medfly, 1958. (Color, 15¼ min.)

MEDITERRANEAN FRUIT FLY

ERADICATION AND REGULATORY PROGRAM



Number of traps in operation — 32,258

Aggregate number of acres treated — 6,806,363

▇ Counties originally infested — 28

All Florida counties removed from Federal and State regulation. No spraying since March 1958.

JUNE 30, 1958

MEXICAN FRUIT FLY

History: The Mexican fruit fly (Anastrepha ludens), a native of northeastern Mexico, appeared in southern Texas in 1927. Large numbers of these insects migrate from northeastern Mexico to southern Texas during fall and winter months. In 1954, fruit flies were trapped at intervals from January to November in northern Baja California, Mexico. Records indicate that the shipment of infested fruit into Mexican fruit fly-free areas can serve as a source of new infestations.

Nature of Pest: The Mexican fruit fly attacks citrus and a variety of other fruits. The female pierces the rind of the fruit and lays numerous eggs beneath. When the eggs hatch, the larvae feed until the fruit falls to the ground. The larvae, when full-grown, leave the fruit and go into the ground to pupate, followed soon by the emergence of adults. Three to five generations may occur in a year.

Survey, Quarantine and Control: The control program has three objectives: (1) Enforcement of Federal Quarantine No. 64 to prevent the spread of the pest from the infested area in southern Texas to other fruit-growing sections; (2) cooperation in California and northwestern Mexico in a campaign to eradicate the light infestation near the International Border; and (3) cooperation with the Mexican Department of Agriculture in enforcement of the Mexican quarantine in the northern part of Baja California and Sonora. There, the Plant Pest Control Division is cooperating in the following phases of the program: enforcement of quarantine regulations, inspection of groves and trapping for detecting infestations, and treatment of infested fruit moving from the regulated areas.

The pest has spread over the Republic of Mexico. The current losses to citrus and mango fruit growers of eastern Mexico run from an estimated 8 percent to 38 percent of the crops. No economic losses to the fruit industry have occurred in Baja California, Mexico, or the States of California and Arizona, U.S.A. Although fruit flies have been trapped in these areas, infestations have not been permitted to become established. Fruit losses in Texas attributable to this fly have been very low in recent years.

The Current Situation: The Mexican fruit fly apparently does not survive the summers in the Texas citrus areas but migrates from Mexico each fall and infests citrus fruits, particularly grapefruit, in the lower Rio Grande Valley. Infestations vary greatly from year to year and were extremely light during the 1957-58 fruit season.

The first season's operation under the new Mexican fruit fly quarantine regulations gave better protection against the spread of the fruit fly and, at the same time, eliminated unnecessary restrictions on shipments to large areas of the United States. Also, further progress was made in the adaptation of the gas fumigation process to commercial use in the packing plants. Fourteen additional fumigation chambers were completed in Texas during the season bringing the total in operation to 25, all of which are located in 20 packing sheds over the area. Another helpful service to the public in handling of small shipments requiring treatment was instituted during the past season when a commercial company made arrangements with the Railway Express Company whereby express shipments to areas where treatment is required are assembled at the Harlingen, Texas, express station for fumigation chamber processing.

Insofar as is known the Mexican fruit fly is not present in the States of Arizona and California although it has been trapped along the International Border annually since 1954. The program in Arizona and California consists of intensive fruit inspection and trapping and the application of control treatments during periods when flies might be present in the southern parts of these two states. As a part of its preventive program, California has applied more than 70 cover sprays to nearly a million plants within its border protection zone.

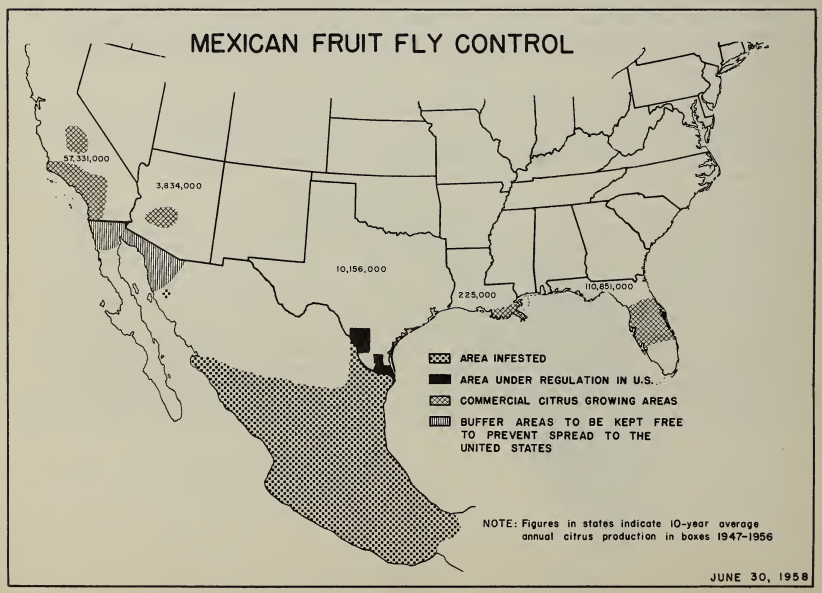
In June 1958 under the cooperative program with Mexico, a total of 1,130 traps were in operation on 453 properties at Tecate, Tijuana, and Ensenada. Visual inspections also constitute a segment of this cooperative program. During the fiscal year, 96 specimens were trapped on 43 properties. As a protective measure sprays were applied to more than 400,000 host plants on the infested properties and the environs. This cooperative effort of the Mexican Department of Agriculture and State and Federal authorities in the United States apparently has stopped the northward spread of the Mexican fruit fly and obviated the need for a costly eradication program in California.

Most Recent Informational Aids:

Publication: The Mexican Fruit Fly—How We Fight It, PA 265, U. S. Department of Agriculture, July 1955.

Quarantine: Federal and State.

Slides: Series of 20 2x2 slides with legends. November 1957. Available for loan.



MORMON CRICKET

History: Since the days of the early settlers the Mormon cricket, a large, wingless, long-horned grasshopper, has remained a periodic pest and threat to agriculture. The range of the Mormon cricket extends from the Missouri River westward to the Cascade and Sierra Nevada Ranges and from the Canadian Border to northern Arizona. During the 1930's Mormon crickets reached the largest outbreak proportions on record. A survey in the fall of 1938 revealed damaging populations in Colorado, Idaho, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming. Nevada, Montana, Wyoming, and Idaho have had the most widespread outbreaks. While it is less destructive than many other insects, the suddenness and severity of its attack on range and cultivated crops and the overwhelming numbers in the attacking bands make it one of the most spectacular of all insects. The greatest damage is to range forage. It feeds on more than 250 species of range plants and on all cultivated crops that are grown in the area where it occurs. The destruction of seed on forage and browse plants adversely affects the establishment or maintenance of range cover.

Nature of Pest: The Mormon cricket maintains itself in permanent breeding areas located in and around mountain ranges of the West such as the Big Horn Mountains in Wyoming, the Pryor Mountains in south central Montana, and the Ruby and Independence Mountains in Nevada. When populations have increased to a high concentration, the crickets leave these breeding areas and infest adjacent range and farmlands. Usually two or three years are required for an outbreak to develop. Mormon cricket eggs are laid just below the soil surface in midsummer and by the time the ground freezes, the young crickets are fully developed within the eggs but they do not hatch until the ground warms the following spring. Hatching normally starts about April 1. The nymphs pass through seven stages of growth, each separated by molts. They become adults in about 60 days. About 10 days after becoming adults, the crickets mate, and the females start ovipositing. One female may oviposit as many as 250 eggs, although the average number is probably near 150. A light, sandy-loam soil in a well-drained location is usually chosen for ovipositing, preferably on a southern, eastern, or western slope. Unlike grasshopper eggs which are deposited in a pod, cricket eggs are laid singly. Often, as many as 100 are found closely grouped.

Migration throughout their active lives is a characteristic of Mormon crickets. By the time the crickets have molted four or five times the migrations have become general, and the converging bands may cover hundreds of acres. Migrations continue until ovipositing starts. On the basis of 50 favorable days from the time migration starts until ovipositing begins, a band may travel 25 to 50 miles in a single season.

Survey and Control: Measures to control Mormon crickets have evolved through progressive stages as rapidly as research has led the way. Early operations to halt migrating bands involved the use of trench barriers, wood or metal barriers, oil on water barriers and dusting the insect with sodium arsenite dust. In 1935

attempts to find cheaper and less dangerous methods were started. It was discovered that baits were very effective. Several formulations were tried until the present rolled-wheat bait was developed. It is applied by ground spreaders and by airplanes in the path of migrating bands. It is preferable to spread the bait when the crickets are migrating. Under such circumstances the crickets feed immediately, and the results will be evident in 24 hours or less. If the bait is spread while the crickets are inactive, control is often delayed and often ineffective.

During the period 1937-1949, more than 673,000 acres of cropland in the Rocky Mountain region were damaged by the Mormon cricket. Most of this damage was done before 1942, prior to the extensive use of bait treatment now used in control campaigns.

The Current Situation: Mormon cricket control activities remained at approximately the same level as for 1957. In 1958 73,203 acres of rangeland were baited in five states. Rolled-wheat impregnated with aldrin was used to bait 38,104 acres in Nevada; 26,258 acres in Utah; 7,255 acres in Montana; 1,560 acres in Idaho; and 26 in Wyoming. Most recent 1958 surveys reveal incipient infestations in Idaho, Nevada, Utah, Montana, and Wyoming. These will be kept under observation during 1959 and control applied if necessary.

Most Recent Informational Aids:

Publication: Mormon Crickets—How To Control Them, Farmers' Bulletin No. 2081, U. S. Department of Agriculture, July 1955.

Slides: Series of 5 2x2 slides. Available for loan.

PEACH MOSAIC DISEASE

History: Peach mosaic is a serious disease of peaches and affects almond, apricot, nectarine, and plum. It was first recognized in Texas in 1931 and is now known to be present in the States of Arizona, Arkansas, California, Colorado, New Mexico, Oklahoma, Utah, and Texas.

Nature of Disease: The disease is caused by a virus transmitted from diseased to healthy trees by a microscopic eriophyid mite (*Eriophyes insidiosus*). In the spring, newly formed leaves on affected trees become mottled and short internodes develop causing profuse branching. The surface of the fruit in many varieties becomes irregular and bumpy. The commercial value of a severely infected planting may be destroyed within 3 to 6 years. At one time approximately 30,000 infected trees were known to be present in each of the States of California and Colorado.

Survey, Quarantine and Control: The objectives of this program are: (1) Preventing further spread of the disease by adequate nursery and budwood inspection and uniform state quarantine enforcement; (2) assistance to growers in reducing the incidence of the disease in infected commercial areas; and (3) conducting surveys for the disease in areas where it is not known to occur. The States, the Federal Government, and industry cooperate in this program.

Control is effected by the prompt removal of infected trees. There has been a reduction in peach mosaic incidence over the total area. Quarantine enforcement to date has prevented the establishment of new areas of infection which would have developed had the shipment of infected nursery stock and budwood been permitted.

This control activity is considered as a holding program and will continue as such until improved control techniques are developed. The development of a control for the mite vector is an important need.

Research on control of the peach mosaic vector is being done by the Entomology Research Division, Agricultural Research Service, Riverside, California. Phytopathological studies are being carried on also at Riverside, California, by the Horticultural Crops Research Division, Agricultural Research Service. State research agencies in affected areas are cooperating. These studies include testing tolerant or resistant peach varieties to the several strains of the peach mosaic virus.

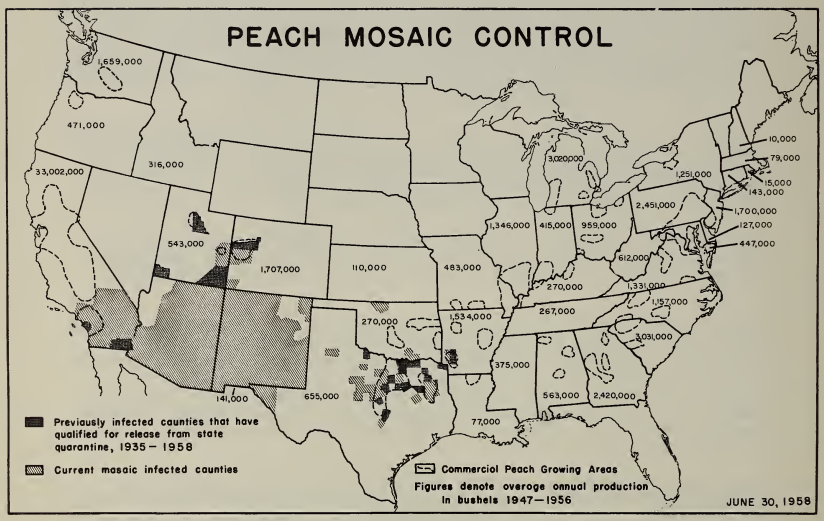
The Current Situation: During the fiscal year 1958, inspection was made of 2,803,640 trees of which 3,114 were found infected with peach mosaic. This is an over-all disease incidence of 0.1 percent in 1958 as compared to 0.5 percent in 1957; 0.7 percent in 1954; 1.3 percent in 1953; and 2.5 percent in 1952. In Colorado, in the counties with the most infection, the incidence in 1958 was only 0.3 percent. It is believed that this low incidence of peach mosaic infection now present has resulted from the intensive survey and tree removal program. This condition offers a most favorable environment in which to approach the field control of the newly discovered insect vector of the disease.

Most Recent Informational Aids:

Publication: Peach Mosaic, How We Fight It, PA 336, U. S. Department of Agriculture, November 1957.

Quarantine: State.

Slides: Series of 15 2x2 slides with legends, April 1958. Available for loan.



PESTICIDE REGULATORY ACTIVITIES

Objective: The objective of the Pesticide Regulations Section's program is the administration of the Federal Insecticide, Fungicide, and Rodenticide Act of 1947 and those duties delegated to the Secretary by Section 408 (1) of the Pesticide Chemicals Residue Amendment to the Federal Food, Drug, and Cosmetic Act. The insecticide act is designed to assure the users of these materials that commercial pesticides will be effective for the purposes for which they are sold and that they may be used in a manner which will not result in injury to users or others who are exposed to them. These objectives are accomplished by reviewing labeling for products which are intended for interstate shipment to determine if such labeling describes the performance potential of the material and the mode of use which will allow for safety. This review usually takes place during the consideration of labeling submitted for registration under that provision of the statute.

The Section samples interstate shipments of these materials and takes authorized legal action, when appropriate, against shippers of improperly labeled or adulterated pesticides. In the administration of this act, close cooperation is maintained with the various State officials carrying out State pesticide laws. This cooperation is designed to promote uniformity in the administration of the Federal and State statutes.

Under the Pesticide Chemicals Residue Amendment to the Federal Food, Drug, and Cosmetic Act, the Section must certify the utility of each chemical for which a tolerance or exemption is sought and advise the Food and Drug Administration as to the probable residues which will result on the crops being treated with the chemical, when used in accordance with the proposed directions.

Registration Activities: Since the enactment of the Federal Insecticide, Fungicide, and Rodenticide Act of 1947 more than 51,600 products have been registered. During the fiscal year 1958, 4,600 new products were registered; labels were amended for 3,554 additional products; and 1,822 distributors' labels were registered. In the registration program which requires a determination of the safety and effectiveness of each use claimed for an economic poison, the determinations are made on the basis of soil and climatic conditions as they exist throughout the entire United States. The cooperating states are informed of the bases on which these materials are accepted for Federal registration. State officials are thus guided in solving their local registration problems and, when necessary, can thus modify the use of these materials to fit the special conditions existing within their states.

Enforcement Program: Federal investigators collect pesticide samples from interstate shipments. These are analyzed chemically and tested biologically to determine compliance with label claims. When violations are detected, legal action may be initiated. Cooperative agreements have been effected with many states under which the Section is furnished with results of analyses by State chemists which may ultimately provide a basis for possible Federal action. During the fiscal year 1958, the Section personnel examined 1,301 samples of economic poisons. Two hundred fifty-one were found to be so seriously misbranded, adulterated, or otherwise in violation of the Act as to warrant citation and/or seizure. In addition, 126 products were less seriously in violation and labeling was corrected by correspondence. Eight hundred forty-one, or 64 percent, of the products sampled were not previously found in interstate commerce.

Fifteen shipments were seized, including 24 different economic poisons. One hundred eighty-four shipments offered for importations were reviewed and 80 of these were sampled. Five shipments were detained due to failure to comply with the law but were later released when brought into compliance.

Methods Development: To keep abreast of the rapidly developing pesticide market, new methods of analyses and testing must be constantly developed to determine the compositions and performance of the many new chemicals being introduced. This work is done on both Federal and State levels, often on a cooperative basis.

The Current Situation: During the year a statistical study to determine the reliability of results obtained in the A.O.A.C. phenol coefficient test for disinfectants was completed. This data was needed to support the Section's regulatory testing program. Studies were conducted also on the Chambers Modification of the Webber and Black method for testing the effectiveness of sanitizers employed in dairies, food plants, restaurants, and taverns so that these procedures could be standardized for referee work. The method has now been accepted on a First Action basis by the Association of Official Agricultural Chemists.

The Section also issued a publication entitled "Antimicrobial Additives" which distinguishes between the various classifications of products in the germicide field and which establishes guidelines for the label claims which may be made for these products. During the year Section personnel also cooperated with Research Divisions of the Agricultural Research Service responsible for the preparation and publication of "Insecticide Recommendations" and "Suggested Guide for Chemical Control of Weeds." Section personnel reviewed closely the proposed recommendations so as to effect consistency with the uses accepted for registration under the Federal Insecticide, Fungicide, and Rodenticide Act.

In view of the rapid increase in the number of outbreaks of infections in hospitals by antibiotic-resistant Staphylococci, a special project on hospital disinfectants has been initiated. This project has as its objectives: (1) A determination of the effectiveness of the various germicides registered for hospital use against antibiotic-resistant Staphylococci; and (2) determination as to the various germicides actually being used in hospitals as related to those registered under labeling bearing recommendations for such use.

The Section also cooperated with other Division personnel in the preparation of the Government's defense in the "gypsy moth" trial held in Brooklyn, New York.

PHONY PEACH DISEASE

History: Phony peach disease was first observed at Marshallville, Georgia, about 1885. The disease is thought to be native to the United States. It now occurs in 12 states located east of and including Texas and is serious or potentially serious only where the range of the insect vectors overlaps areas of peach production. It is considered a serious threat to commercial peach production in Alabama, Georgia, South Carolina and in the southeastern parts of Arkansas and Missouri, eastern Texas, and northern Louisiana.

Nature of Disease: Phony peach disease is caused by a virus which is known to be transmitted by several species of leafhoppers, one of which appears to be much more important in disease transmission than the others. The disease affects not only peach but apricot, almond, nectarine, and plum. Trees are not killed outright but the fruit becomes progressively smaller each year until production becomes unprofitable. The disease may affect a tree for 18 months before detection is possible, therefore, it is likely that some spread occurs before the diseased trees can be recognized and removed. Discovery that the disease is endemic in wild plums has led to efforts to eliminate plums in the vicinity of peach orchards as an aid to control.

Survey, Quarantine and Control: The objectives of the control program are to prevent the spread of the disease into uninfected areas and to obtain eradication of infested host plants. This is accomplished through: (1) Assisting the grower by inspecting orchards to identify infected trees that must be removed in order that the orchard may be maintained as a profitable planting; and (2) inspecting wild and cultivated hosts to define areas of infection. Since 1929 more than three million phony diseased trees have been eradicated by growers.

A Federal quarantine regulating the movement of peach nursery stock was in effect from 1929 to 1934. Regulation has continued from 1934 under uniform state quarantines established by the infested states.

The Plant Pest Control Division coordinates the program. Meetings and distribution of control information are arranged through the Extension Service. State agencies provide the local authority for inspection and tree removal, assist with inspection, and enforce quarantine regulations.

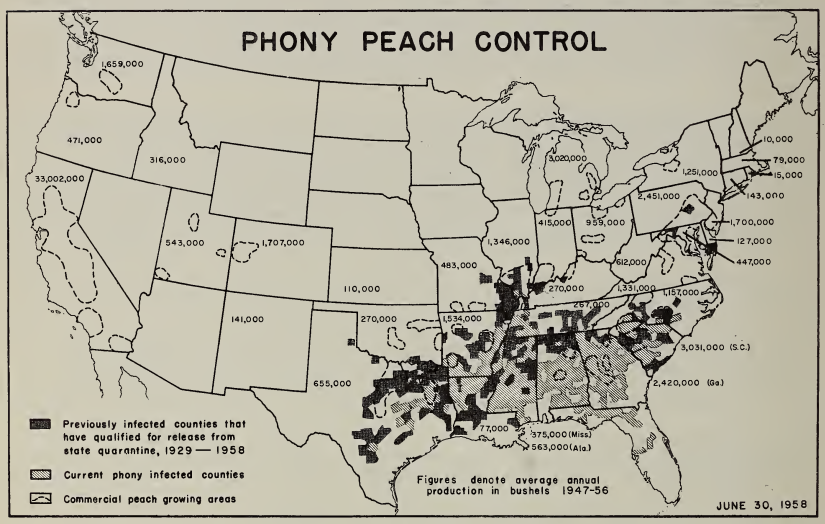
The Current Situation: During the fiscal year 1958, 5,324,956 peach trees in seven southwestern states were inspected, 29,679 of which were found infected with phony disease. These figures indicate the same low incidence of phony disease, 0.5 percent, as was found in 1957. This low over-all incidence of 0.5 percent infection may be compared with 0.7 percent in 1954; 1.3 percent in 1953; and 2.5 percent in 1952.

All of the infected trees found in 1958 were removed by the owners. Complete compliance by the growers in promptly removing infected trees together with careful annual survey appears to be holding the disease at the present low level. Undoubtedly the continued removal of wild plum, a reservoir of phony infection, in the vicinity of peach orchards is favorably affecting the situation.

Most Recent Informational Aids:

Publication: Phony Disease of Peaches, Program Aid 225, U. S. Department of Agriculture, May 1953.

Slides: Series of 11 2x2 slides with legends, January 1958. Available for loan.



PINK BOLLWORM

History: Pink bollworm (Pectinophora gossypiella), an insect native to India, was introduced from Egypt into Mexico in 1911. The first infestation in the United States was found at Hearne, Texas, in 1917, probably introduced on shipments of infested cottonseed from Mexico. The insect now occurs throughout the cotton-producing areas of Texas, Oklahoma, New Mexico, and in parts of Arizona, Arkansas, and Louisiana.

Nature of Pest: The adults of the pink bollworm are small, grayish-brown moths. Each female lays 100-200 eggs on cotton plants near the base of the squares or bolls. Eggs of the first generation are laid on squares and the larva feeds in the square and is fully grown by the time the bloom appears. Green bolls are preferred for egglaying and feeding. The eggs hatch in 4-5 days, and the small, pinkish-white larva feeds from 10-14 days. The complete life cycle in the summertime requires 25-30 days. Most of the larvae overwinter in crop residue left in the fields after picking is completed. The adults do not harm cotton plants but are a cause of spread of infestation as they are carried long distances by wind.

As the pink bollworm larva feeds inside the green cotton boll, it moves from seed to seed, cutting and staining the immature fibers and eating out the seed contents. This results in low viability of the seed, loss of weight of the seed and reduces the amount and value of the oil. Lint from damaged bolls is stained, short, and of low grade. Molds often completely ruin bolls in which pink bollworms have left exit holes. The pink bollworm also attacks okra and a number of other malvaceous plants.

Survey, Quarantine and Control: The objectives of the pink bollworm control program in the United States and Mexico are eradication of isolated infestations and suppression of infestations in areas where eradication is not practicable, thereby preventing or retarding spread by moth flights. The current operations include: (1) Annual surveys throughout the cotton belt to locate new infestations and to provide a basis for regulatory and control actions; (2) enforcement of regulations to prevent spread; (3) operation of traffic inspection stations to prevent commercial dissemination of live pink bollworms; and (4) cooperation with the states concerned in suppressive programs to prevent natural spread of this pest.

The Division cooperates with Entomology Research and Agricultural Engineering Research, Agricultural Research Service; State regulatory officials; Extension Service; national, state, and local trade groups; pink bollworm committees; growers and processors of cotton; and the Mexican Department of Agriculture and trade groups.

Wild Cotton: The discovery of the pink bollworm in wild cotton and in ornamental plantings in southern Florida in 1932 added another threat to commercial cotton production. Although cotton is not grown commercially in this area, it is believed that the infestations in the wild and ornamental hosts were the source of the infestations discovered in northern Florida and southern Georgia. Rigid quarantine regulations are in effect to prevent reinfestations of these and other areas of commercial cotton production.

Originally, infestations of pink bollworm were heavy in wild cotton and ornamental plantings on the mainland in Dade and Monroe Counties, Florida, and in the outlying Keys. To help rid this area of pink bollworm,

systematic destruction of wild and ornamental plants has been under way since 1932. This program has reduced the infestations to a very low level with the subsequent danger of migration correspondingly low. When this operation was curtailed in 1947 and 1948, populations of pink bollworm again built-up to dangerous levels in some of the Keys. By 1949 many infestations had reached the 70 percent level. Due to the gradual reduction of wild and domestic host plants over a period of years, as well as the establishment of non-cotton zones within the general area, pink bollworm populations in Florida have been kept at a very low point. Only one isolated area on the Florida Keys, in Monroe County, is now known to be infested with pink bollworm.

The Current Situation: The cotton-producing areas of Texas, New Mexico, and Oklahoma are known to be infested with pink bollworm. The infestation is generally light except for a few counties in southern and western Texas and southwestern New Mexico. In Louisiana the infestation is confined to four counties, all located in the southwestern part of the state. Three of these counties were found infested for the first time in 1957. In Arkansas intensive surveys in the pink bollworm regulated area and adjacent nonregulated counties revealed only two pink bollworms during the entire season. In Arizona five of the eight cotton-producing counties are in a regulated area; however, live pink bollworms have not been found in Pima and Santa Cruz Counties since 1954. Infestations have been light in Graham, Greenlee, and Cochise Counties until this year when a slight increase in the population was recorded. No other infestations of pink bollworm are known in the United States.

Aggressive suppression programs have confined damage to limited acreages in western Texas, southeastern New Mexico, and Oklahoma. These suppressive measures include uniform planting and stalk destruction in state mandatory control zones. Well-planned insecticide applications also help to prevent population buildups during the fruiting of the cotton.

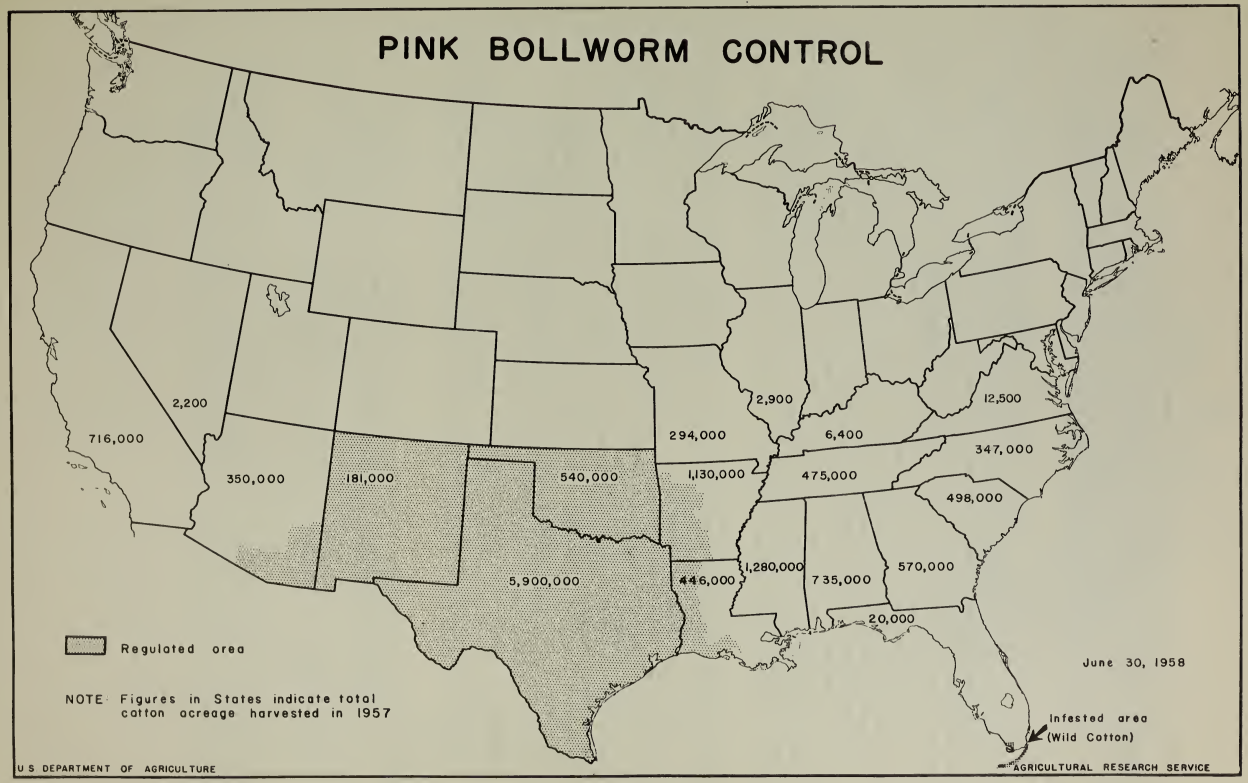
The cooperative program with Mexico in establishing a protective zone involving the border states of northern Mexico is playing an important role in the suppressive efforts in Texas. Populations of pink bollworm have been held at an extremely low level in these states. This has reduced materially the danger of migration to the north from this area.

Most Recent Informational Aids:

Publication: The Pink Bollworm, How We Fight It, U. S. Department of Agriculture Leaflet No. 339, 1953.

Quarantine: Federal and State.

Slides: Series of 15 2x2 slides with legends. June 1958. Available for loan.


PINK BOLLWORM CONTROL
716,000
2,200
350,000
181,000
540,000
5,900,000
294,000
1,130,000
446,000
2,900
6,400
475,000
1,280,000
735,000
20,000
12,500
347,000
498,000
570,000
Regulated area
NOTE Figures in States indicate total cotton acreage harvested in 1957
June 30, 1958
Infested area (Wild Cotton)
U S DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE

PLANT PEST SURVEY

History: The survey program to determine the abundance of insects and related pests of economic importance was organized on its present basis in 1952. The program is national in scope, founded on cooperation with the states. In addition to general insect survey operations, the control and regulatory programs of the Plant Pest Control Division are given special attention.

The Insect Pest Survey, which preceded the present program, was organized in 1921 by a group of entomologists volunteering to contribute information on incidence of insect pests in the United States. This was compiled and issued at monthly intervals. In 1950, the Civil Defense Administration asked the United States Department of Agriculture to use its facilities to combat possible intentional introduction of insects, and diseases of livestock, crops, and forests. The following year, the Bureau of Entomology and Plant Quarantine discussed with various State agricultural agencies the advisability of setting up a "clearing house" for screening insect specimens and reports in each state and making this information available to the Bureau for a weekly national report. This led to the development of the present cooperative survey organization with the states. Some of the state programs are organized entirely on a voluntary basis, others utilize a survey entomologist who is jointly financed by the state and the Division. Jointly financed programs are now in effect in 28 states.

Objectives: Through cooperation of Division officials and various State and Agricultural Research Service agencies, plans and procedures are formulated for the nationwide collection, reporting, and forecasting of insect abundance. Included are operational surveys essential to plant pest control and regulatory programs. In addition, the program aims to obtain information on economic insects to: (1) Assist farmers to more adequately protect their crops from insect attack; (2) supply current information on insect activity to agricultural workers; (3) aid and assure prompt detection of newly introduced insects, assisted by informative, illustrated releases published in the Cooperative Economic Insect Report; (4) develop a workable insect pest-forecasting service; (5) determine losses by insects; (6) aid manufacturers and suppliers of insecticides and equipment to determine where supplies are needed; (7) develop nationwide uniformity in reporting insect conditions; (8) maintain records on occurrence of domestic and foreign economic insects; and (9) provide a nationwide organization for biological warfare defense as it relates to insects.

Operational Procedures: Economic insect information for release in the weekly Cooperative Economic Insect Report is submitted through the state clearing houses by various cooperators and collaborators in entomology and related agricultural fields. Included are such agencies as state extension services, experiment stations and regulatory offices; Plant Pest Control Division and other related Federal agencies; and interested commercial organizations.

Field entomologists and agricultural workers collect and forward insect specimens to the clearing houses for determinations or to the Division where prompt identifications are made through cooperation with the Entomology Research Division and the United States National Museum.

Approximately 3,000 of the Cooperative Economic Insect Report booklets are circulated weekly to personnel concerned with insect pest conditions. Information published in the report is filed in the permanent records of the Division. The files include over one-half million notes on some 25,000 domestic and 20,000 foreign insect species. These records are readily available to Federal and State agencies as well as to the public.

Most Recent Informational Aids:

Publications: Insects Not Known to Occur in the United States, Compilation of numbers 1-36 of series, 1957.

Survey Methods, 1958.

REGIONAL INSECT CONTROL PROJECT
FOREIGN TECHNICAL ASSISTANCE PROGRAMS

History: Since 1954 the Plant Pest Control Division has assisted the United States Operations Missions of the International Cooperation Administration and the governments of cooperating countries abroad in the development of practical insect control programs in Lebanon, Iran, Pakistan, Afghanistan, Ethiopia, Tunisia, Iraq, and Libya. Prior to this date this program was known as the Regional Locust Control Program and was administered cooperatively by the State Department, the Foreign Agricultural Service, and the Bureau of Entomology and Plant Quarantine. The program is filling an important need in the foreign technical assistance programs.

Objectives: The objectives of the foreign technical assistance programs are: (1) To assist the United States Operations Missions in their efforts to aid the governments of cooperating countries in the development and direction of practical control programs against major insect pests; (2) to maintain facilities and services for a coordinated locust control program in the Near East, Africa, and South Asian countries; (3) to train nationals in aerial application of pesticides; (4) to assist in the development and organization of plant quarantine programs; and (5) to aid the United States Operations Missions in developing coordinated insect control programs in the various countries and to coordinate International Cooperation Administration insect control activities involving cooperation with international and other organizations.

The Current Situation: A major accomplishment in fiscal year 1958 was the assistance given to Iran, Iraq, and Turkey during the most serious desert locust invasion in several years. Swarms of locusts from Saudi Arabia overflew the desert breeding areas depositing their eggs in cultivated farmland. Iran and Iraq were the scene of intensive control campaigns. The three countries required a minimum amount of assistance on surveys and transportation of additional insecticide purchased from the United States. Iran, alone, controlled locusts on 1,340,000 acres. Most of the control was accomplished by air-to-ground spraying by aircraft owned and operated by local pilots.

Following a request from the government of Tunisia, an agreement was signed with the United States Operations Missions and the Ministry of Agriculture setting up an entomological program for that country. After a preliminary survey of insect conditions, an entomologist was assigned to Tunis on June 23, 1958.

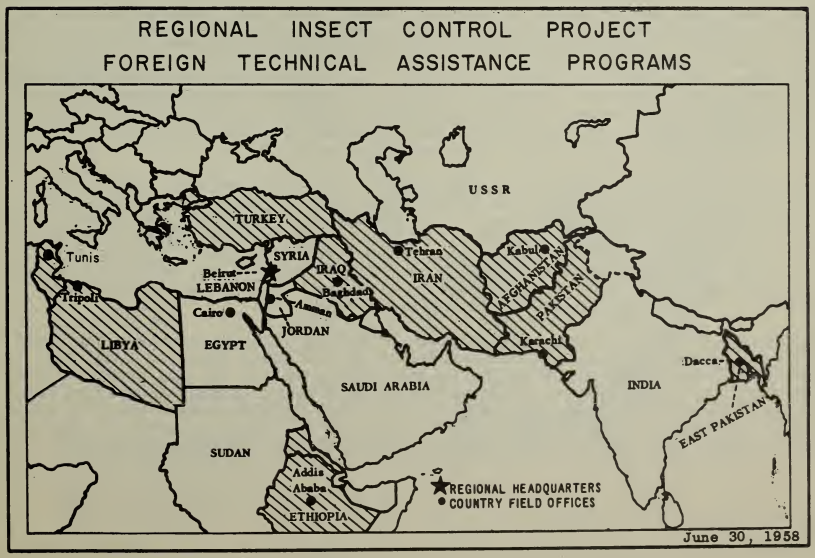
Another major activity was centered in Turkey. A technician was sent to Ankara for six weeks during the 1957 growing season to assist the Ministry of Agriculture in its large-scale control operation against the Senn pest of cereals. At the request of the Mission, another technician was sent to Turkey to review the quantities and specifications of the Government's estimated requirements of pesticides for the 1958 season. This was done in order that the Mission could evaluate more accurately Turkey's request for pesticides and for pesticide manufacturing facilities. From June 23 to July 5, a quarantine school was held in Intanbul and Uzunkopru, Turkey. Two technicians assisted in organizing and conducting a most successful course which covered the major activities of quarantine significance.

The Regional Insect Control Project has active programs in operation in eight countries. Temporary assistance was given to three additional countries in 1957. A staff of ten technicians and four pilot mechanics are conducting a broad program to which has been added the development of plant quarantine programs. The operating costs for these activities have decreased considerably from year to year since cooperating countries now furnish their own pilots, planes, and pesticides.

Before the end of the fiscal year, the political situation and the civil war in Beirut almost made it impossible for us to carry out our program from that location. It became increasingly difficult to attend to routine administrative matters at the office in the American Embassy. Consequently, temporary headquarters were set up in Rome Elsewhere program operations continued uninterrupted and there was increasing interest in plant programs.

Most Recent Informational Aids:

Publication: Locust and other Insect Control, in Technical Cooperation Programs in the Near East, South Asia, and Africa, 1951-57. Miscellaneous Publication No. 770, U. S. Department of Agriculture. Released 1958.



SOYBEAN CYST NEMATODE

History: The soybean cyst nematode (Heterodera glycines) occurs in Japan, Korea, and China (Manchuria). It was discovered in the United States at Castle Hayne, New Hanover County, North Carolina, in 1954 and since then has been found as indicated on the accompanying table and map.

Nature of Pest: This pest is a microscopic eelworm which penetrates and feeds inside rootlets. Later, the female larva begins to swell and break through the epidermis but remains attached to the rootlets. When the female dies, a cyst is formed which contains about 400 eggs. When the eggs hatch, the larvae emerge from the cyst and continue the cycle. A life cycle is completed in about three weeks, and five generations may be produced in one crop of soybeans. Soybeans and Adzuki beans are highly susceptible hosts, while snap beans, common vetch and lespedeza are less susceptible. Three new host plants are hemp sesbania, white lupine, and henbit deadnettle. The last named is a member of the Labiatae and is the first host reported not in the Leguminosae.

Severely attacked soybean plants become yellow and stunted and often die. Severe infestations may lower yields to a point where crops may not be worth harvesting. If this pest is allowed to spread, it could become a serious threat to commercial soybean production throughout the United States.

Survey, Quarantine and Control: Soon after discovery of the pest, North Carolina authorities asked the Federal Government to assist in making a survey to determine the extent of the infestation. Early in 1955 the state entomologist issued a notice of the presence of the pest in North Carolina to all state plant regulatory officials. The soybean cyst nematode control program was organized in March 1955; cooperating agencies include the North Carolina State Department of Agriculture, the North Carolina State College of Agriculture, and appropriate branches of the Agricultural Research Service, United States Department of Agriculture.

In March 1956 North Carolina imposed a quarantine on the movement of soil, plant parts, machines, and other materials that might spread the infestation. A Federal quarantine to prevent spread of the pest was put into effect July 26, 1957. Each state concerned has issued a parallel state quarantine or comparable instructions designed to protect uninfested areas within its own boundaries. The Federal quarantine against the soybean cyst nematode permitted the harvesting of the 1957 crops of soybeans, cotton, and other crops concerned without undue inconvenience to the growers. In Missouri alone, 30,000 certificates were issued to cover the movement of 60,000 bushels of soybean seed for planting purposes produced within its regulated area.

Appropriate agencies are conducting studies on the life history of the pest, evaluation of various nematocides in broadcast and row treatments, tests on varieties and selections of soybeans for resistance to soybean cyst nematode, and tests to determine any additional host plants. Crop rotation is an effective means of preventing buildup of the pest. The longer the period between planting of a host crop, the better the chances that light infestations will not survive. It is currently believed that a three to five year rotation will stop the buildup of soybean cyst nematode in soybean fields.

The Current Situation: Damage to soybean plantings from the nematode has been evident in North Carolina since the infestation was found there in 1954, but clearly defined damage to crops in the Mississippi Valley was not observed until 1958 when 200 acres were reported damaged in Tennessee. Symptoms appeared and developed in spots throughout some 25 fields comprising approximately 1600 acres in four counties in Tennessee. Damaged plantings have been observed in Missouri and Kentucky also. While recent surveys indicate local extension of known

infestations, no infestation has been found on some 288,000 acres of land inspected during the past 12 months in 18 other soybean-producing states. Through June 30, 1958, soil inspections have been made on approximately 621,000 acres.

The status of infestations as of June 30, 1958, is as follows:

State	No. counties infested	No. props. infested	Total infested acres
Arkansas	2	110	4,149
Kentucky	1	6	785
Mississippi	1	1	300
Missouri	3	99	3,568
North Carolina	3	110	2,494
Tennessee	4	126	7,214
Total	14	452	18,510

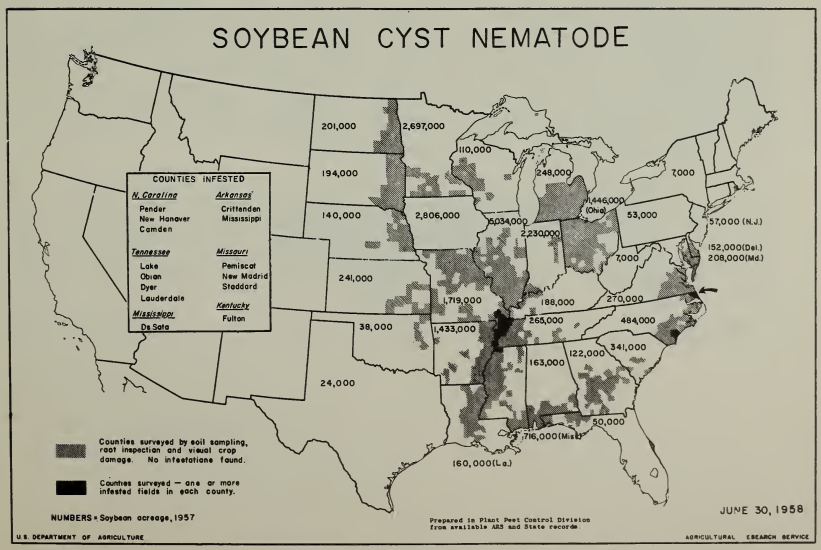
Most Recent Informational Aids:

Publications: Soybean Cyst Nematode, ARS Special Report, ARS 22-29, Agricultural Research Service, U. S. Department of Agriculture, August 1956.

The Soybean Cyst Nematode, A New Pest, PA 333, U. S. Department of Agriculture, May 1957.

Quarantine: Federal and State.

Slides: Series of 9 2x2 slides with legends. Available for loan.



SWEETPOTATO WEEVIL

History: The sweetpotato weevil (Cylas formicarius elegantulus) was first recorded in Louisiana in 1875 and shortly thereafter in Florida and Texas—indicating that it was introduced through several Gulf coast ports at about the same time. It came from Asia. At present it is known to occur in Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas.

Nature of Pest: The eggs of the sweetpotato weevil are small, yellowish-white, and oval in shape. The larva is a white, legless grub with a brown head and when full-grown measures about 1/4-inch long. The adult is a snout beetle resembling a large ant. It prefers the tuberous root but will feed on leaves and vines. The grubs cause the principal damage by burrowing through the potato leaving it with a bitter taste and unfit for human, and sometimes animal consumption. Growers frequently have losses ranging from 20 to 50 percent of the crop in the field and additional damage in storage. The weevil is so abundant in some sections that sweetpotatoes cannot be grown profitably. It reproduces at the rate of 6 to 8 generations per year. The Louisiana State University and the State Extension Service estimated that this pest damaged the commercial crop of sweetpotatoes in Louisiana in 1946 to the amount of nearly $3,000,000.

Survey, Quarantine and Control: Control of the pest depends upon strict adherence to recommended procedures and constant care on the part of the grower to prevent reinfestation. The program objectives are: (1) To eradicate the weevil in areas where feasible; (2) to suppress populations in the remaining areas provided the extent of sweetpotato production warrants such action; and (3) to prevent its spread into uninfested areas. This requires making surveys to locate outlying infestations, establishing non-sweetpotato-growing areas, conducting cooperative control programs in areas of heavy commercial production, and treating sweetpotatoes shipped from infested areas.

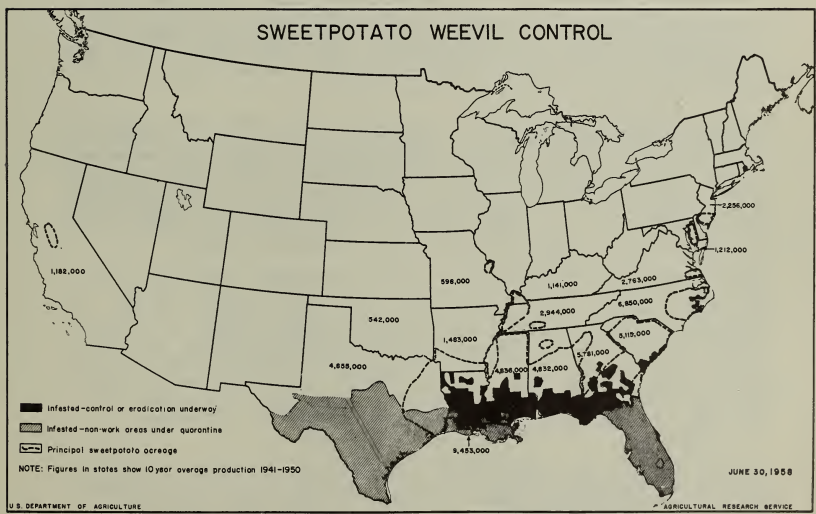
Alabama, Georgia, and Mississippi established sweetpotato weevil control programs in 1937. Louisiana and South Carolina, respectively, inaugurated control programs in 1944 and 1946. The program includes planning and direction, technical assistance, demonstrations, surveys, eradication measures, suppressive measures in areas of heavy commercial production, and quarantine enforcement. For the past several years cooperating states have contributed about 75 percent of program costs, with state funds averaging more than 65 percent of the total funds expended since the program started.

The Current Situation: During the fiscal year 1958, the sweetpotato crop in six infested southern states was protected from attack by the sweetpotato weevil through the application of insecticides to more than 2,000 sweetpotato seedbeds, the treatment with insecticides of some 14,000 acres of plantings, and the dusting at harvest of over 1,000,000 bushels of sweetpotatoes before storage in the fall.

In addition to the effects of the now well-established use of insecticides for weevil control by the growers, severe winter freezes followed by a wet spring resulted in extensive destruction of volunteer and wild host plants which caused further reduction of populations. Weevil damage to sweetpotatoes was less than in any year since 1950. The number of new counties found infested was 40 percent less than in 1957, and the number of farms freed of sweetpotato weevil increased 22 percent over the previous year. Because of the effectiveness of the recently approved insecticides, sweetpotato-growing is being expanded in northwest Florida, in Louisiana and, to some extent, in other states.

Most Recent Informational Aids:

Publication: The Sweetpotato Weevil, How To Control It, Leaflet No. 431, U. S. Department of Agriculture, June 1958.



WHITE-FRINGED BEETLE

History: The white-fringed beetle (Graphognathus spp.), which causes severe injury to field crops and ornamental plants, was first found in the United States in Okaloosa County, Florida, in 1936. Introduction was probably from South America where it occurs in Argentina, Brazil, Chile, and Uruguay. It now infests about 600,000 acres in Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee.

Nature of Pest: All white-fringed beetles are wingless females. Emergence of the beetles from the soil begins in late May and continues into September and October. A few days after emergence the beetles begin laying eggs, cementing them in small masses to plant stems, sticks, debris, or soil particles. Lumber, building materials, cotton bolls, seed cotton, velvetbean pods, farm implements and other such articles in contact with the soil may have eggs attached to them. The grubs, which develop from the eggs, feed on roots and underground stems of young plants in the spring. They gnaw the taproot and bottom part of the stem but feed very little on laterals. Grubs and adults have been observed feeding on 385 species of plants including such important ones as cotton, corn, soybeans, velvetbeans, peanuts, potatoes, sweetpotatoes, tobacco, strawberries, kudzu, lespedeza, lupine, oats, and on the roots of peaches, pecans, tung, and willow.

In some fields up to 70 percent of the plants have been killed in areas ranging from a few square yards to large acreages. Even light populations can seriously damage truck crops. The threat of the pest is emphasized by the great variety of plants attacked which include almost every major crop plant of the nation.

Survey, Quarantine and Control: Objectives fall into four categories: (1) Surveys in regulated areas to determine the degree of infestation on which regulatory and control requirements are based; (2) surveys for the pest in areas where it is not yet known to be established in order to discover initial areas of infestation while still confined to small acreages; (3) enforcement of Federal and State quarantines; and (4) suppression and eradication of infestations to prevent spread of the pest and to assist the grower in preventing losses.

Various emergency control methods such as ditching, trap crops, and flame throwers were used originally. These were followed by the use of calcium arsenate and cryolite as foliage applications. DDT, dieldrin, chlordane, and heptachlor are now used as soil or foliage treatments. The possibility of eradication of the beetle in a given infested area through effectiveness of these treatments becomes more and more encouraging. The value of such treatments is demonstrated by the fact that infestations for the most part have been kept at a low level, spread has been retarded, and extensive crop damage prevented.

Acreage treated and later found free of beetles for three years is eligible for removal from regulation if isolated from other infestations or otherwise protected. A review is being made of survey results and treatments applied to areas in Louisiana, North Carolina, and Tennessee to determine if certain acreage may be removed from regulation.

The Current Situation: In fiscal year 1958 soil treatments were applied to more than 49,000 acres and foliage treatments to more than 40,000 acres in the effort to eliminate white-fringed beetles. During the same period about 48,000 acres of contiguous territory were found to be infested. Materials and facilities are available and treatments are being applied to all remaining infested areas in South Carolina. That state has an infested acreage of about 7,000, of which approximately one-half has already been treated. Only one beetle, in a moribund condition, was found in New Jersey during the year.

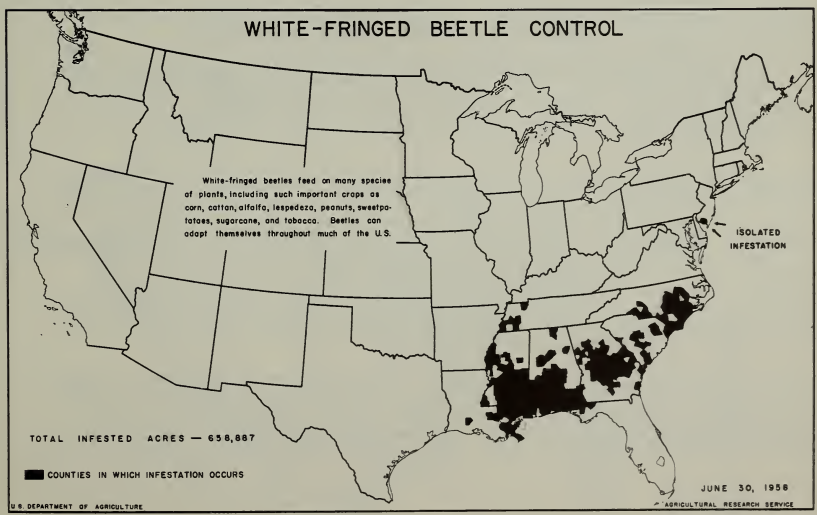
Particular attention is being devoted to treating nurseries, railroad yards, and loading points to reduce or eliminate beetle populations as a means of preventing contamination of products being shipped and thereby reducing the hazard of long-distance spread.

Most Recent Informational Aids:

Publication: The White-Fringed Beetle, How To Control It With Insecticides, How To Prevent Its Spread, Leaflet No. 401, U. S. Department of Agriculture, January 1956.

Quarantine: Federal and State.

Slides: Series of 12 2x2 slides with legends, May 1958. Available for loan.



WITCHWEED

History: Witchweed (Striga asiatica), a parasitic flowering plant, was discovered for the first time in the Western Hemisphere late in the summer of 1956 seriously damaging corn in adjoining counties of North and South Carolina. While witchweed is a new pest in the United States, it is an old and widespread problem in the tropics and subtropics of the Old World. It is present in large areas of Asia, Africa, and Australia where it was known to exist as early as 1790 and was recognized to be a serious parasitic weed in South Africa as early as 1900.

Nature of Pest: It is a serious pest of corn, sorghum, and sugarcane as well as 60 other species of the grass and sedge families including rice, wheat, oats, and barley. The roots of corn, sorghum, sugarcane, Sudan grass and crab grass stimulate the germination of witchweed seed and then are parasitized by the pest; however, peanuts, sunflowers, cowpeas, soybeans, and castor beans stimulate seed germination without being parasitized.

Witchweed may be easily identified by its small brick-red or scarlet flowers although they occasionally may be yellowish-red, yellow, or almost white. The leaves are slightly hairy. The plants rarely grow more than 8 to 9 inches high; however, they may reach a height of 18 inches. The weed develops underground for six weeks to two months; it is during this period that the principal damage is done to the host. After vegetative parts appear above ground, it develops like any other plant but still depends upon the host for water and soil nutrients. The plant thrives on a wide range of soil types but appears to prefer a light sandy soil. Symptoms of infestation include severe wilting, stunting and yellowing of the host plant; eventually the leaves turn brown and the plant dies. Witchweed plants normally produce from 50,000 to 500,000 almost microscopic seed per plant.

Survey, Quarantine and Control: A public hearing to consider placing a Federal quarantine on witchweed was held in Washington, D. C., January 30, 1957. A second session on the subject was held March 5, 1957. The National Plant Board, officials of North and South Carolina, as well as representatives of 14 other states who attended the meetings or furnished written statements generally agreed that a Federal quarantine was necessary. As a result a Federal quarantine and regulations became effective September 6, 1957.

The long-range objective of the witchweed program is complete eradication. Methods to be used to accomplish this include: (1) The use of chemical herbicide treatments; and (2) cultural practices such as growing catch crops of corn, sorghum, Sudan grass and sugarcane or by growing crops immune to infestation. The catch crop which promotes witchweed germination is plowed under before mature seed is produced on the witchweed plants. Farmers are being encouraged to adopt these cultural practices. The program initiated during fiscal year 1957 consisted mainly of surveys to determine the severity and extent of infested areas. Studies were started and are being conducted now by the Agricultural Research Service on the development of chemical control plans.

A field-scale test eradication program was initiated in May 1958 in North Carolina and South Carolina on approximately 1,000 acres. Under the plan the owners or operators of the land agree to grow catch crops on their infested land. This field-scale test involves planting two catch crops during the growing season, plus a small grain cover crop in the fall.

Fertilizer and seed are furnished to the grower by the Division and he is reimbursed at the local prevailing rates for his services in carrying out prescribed management practices. Witchweed eradication management practices are acceptable under the Department's conservation reserve program. Farmers who place their land in this program receive the conservation reserve payment in lieu of income from normal crop production. Witchweed on adjacent noncultivated land is being destroyed with 2,4-D.

The Current Situation: As of June 30, 1958, infestations had been found on 1,324 farms in North Carolina and 419 farms in South Carolina in a total of 17 counties. These farms with an aggregate of 191,185 acres have about 81,000 acres under cultivation. Surveys are continuing in the Carolinas and in adjacent areas of bordering states.

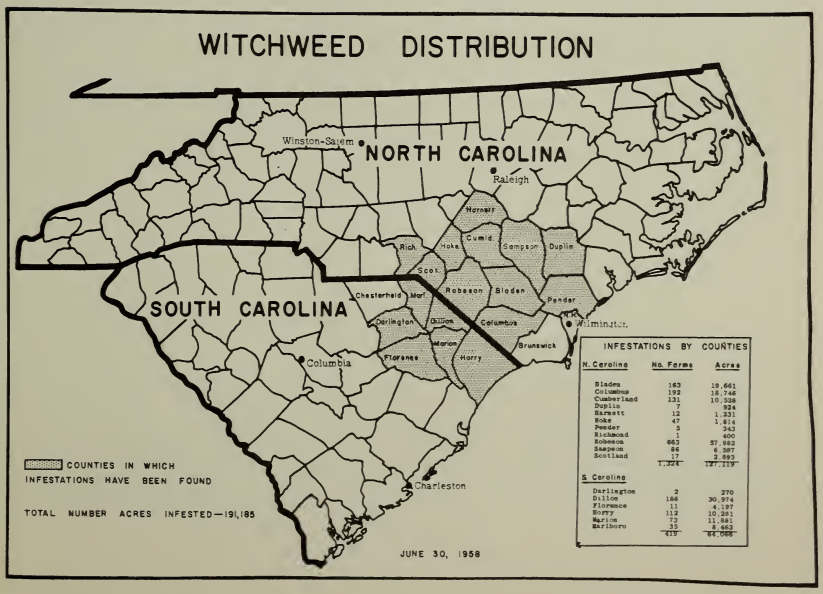
Most Recent Informational Aids:

Publications: Watch Out For Witchweed, PA 331, U. S. Department of Agriculture, April 1957.

Witchweed, ARS Special Report, ARS 22-41, Agricultural Research Service, U. S. Department of Agriculture, June 1957.

Quarantine: State and Federal.

Slides: Series of 16 2x2 slides. Available for loan.



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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
CENTRAL REGION

ANNUAL PROGRAM REPORT

BARBERRY ERADICATION

July 1, 1957 - June 30, 1958

In Cooperation with Other
Federal, State, County, and Local Agencies

November 14, 1958
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

TABLE OF CONTENTS

I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

A. Accomplishment for the fiscal year

During the year, State and Federal workers inspected areas totaling 4,762 square miles for rust-susceptible barberries. Of this number, 2,027 square miles in Kansas and Missouri were worked by the farmstead method. The remaining 2,735 square miles consisted of rework of territory that was previously infested. A total of 16,104 barberry bushes was destroyed on 235 new and 550 previously infested properties. However, regrowth was found on only 13.6 percent of 4,058 locations cleared of bushes on earlier inspections. The year's work and the revaluation of rework requirements resulted in placing 4,106 square miles on maintenance and in inactivating 1,822 properties that at one time harbored barberry bushes.

B. Major deviation from work plan

Only minor deviation from the work plan was necessary, largely because of the urgency and emergency nature of other Division programs. In Illinois, personnel was assigned to Japanese beetle control activities for a limited period. However, these changes did not materially affect the status of the barberry program in Illinois.

C. Status of program at close of year

An analysis of the current status of the program reveals that of the 676,520 square miles initially requiring work, 634,105 are now on maintenance. This means that a high degree of barberry control has been attained and no further organized work is planned for that territory. Outside the boundaries of the areas on maintenance there are 27,324 locations that will require rework one or more times in the future. Much of this rework, involving 17,367 square miles, will require intensive coverage. It includes some of the most rugged territory in areas where barberry bushes had many years to become established, and, because of heavy seeding, will constitute a control problem for many years.

II. PROGRAM ACTIVITY DURING THE FISCAL YEAR

A. Planning and direction

Field activities for the barberry-eradication program were conducted in accordance with plans agreed upon by the Division personnel and the responsible State officials. The state supervisor directed the over-all phases of the comprehensive work program in each of their assigned areas, after frequent consultations with officials of the cooperating agencies.

B. Technical assistance

Technical assistance was provided by Plant Pest Control personnel to property owners and farmers by demonstrating eradication procedures and encouraging them to destroy barberry bushes on their properties. Vocational agricultural classes were given on-the-spot demonstrations of eradication methods. These groups were encouraged to learn the identifying characteristics of the rust-susceptible barberry and to report bushes when they found them. County agents were supplied with informational material and assistance in their program service activities.

Plant pathologists, Experiment Station workers, and Extension specialists provided information to farmers and agricultural groups concerning the importance of barberry eradication to the stem-rust control program.

The Crops Research Division prepares an annual report concerning rust development in the uniform rust nurseries which are established in most states by the Agricultural Colleges. This group reports on the development of stem rust during the growing season and assists in the determination of rust-loss estimates.

C. Survey

Preliminary to organized field operations, reconnaissance surveys were made of areas to observe the prevalence and age of the barberry regrowth. On the basis of this activity, determination is made as to the type of work required, manpower needed, and estimated cost of the operation. These preliminary surveys are made by the district supervisor or his assistant, who is generally familiar with all the infestations in his assigned area.

Annual stem-rust surveys were made of the grain-growing areas in conjunction with the eradication work in 1957. These surveys are made to observe rust development and record severity and prevalence for the purpose of estimating the annual damage caused by stem rust. Also, collections of rusted grain plants and infected barberry leaves are sent to the Cooperative Rust Laboratory for race determination. During the year identifications were made of 1,059 uredial isolates and 18 isolates from aecial collections.

Total stem-rust damage to small grains in 1957 was very light. Loss to winter wheat was estimated at 3 percent in Kansas, 2 percent in Nebraska, and 1 percent or less elsewhere in the winter-wheat-producing states. Damage to spring wheat was negligible, except for a 2-percent loss to durum in South Dakota. The loss for oats was 2 percent in Texas and Oklahoma but less in other sections of the country.

Because of a mild winter in 1956-57, stem rust overwintered on both wheat and oats in southern Texas, and during February the rust developed rapidly. However, cool and cloudy weather in March, followed by low temperature and abundant rainfall during the remainder of the growing season in most of the winter-wheat areas, retarded rust development.

Spring wheat was late, but stem rust appeared later than usual and did not develop rapidly. High temperatures in July and early August hastened the maturity of the grain. As a result, harvest was 7 to 10 days early. Only in the late fields was stem rust prevalent in appreciable amounts on the susceptible varieties, particularly in sections well supplied with moisture.

The only appreciable change in the wheat rust-race pattern over 1956 was a 5-percent decrease in the 17-29 group of races which can attack Selkirk. Definite race shifts occurred, however, in the area comprising the three spring-wheat states of Minnesota, South Dakota, and North Dakota, as race 56 increased 16 percent and race 11 decreased 9 percent.

Race 7 of oat stem rust maintained its predominance for the eighth consecutive year, with some decrease in prevalence during the past two years. Races 6 and 13 were identified from New York and Pennsylvania, and race 6 was also identified from Michigan, Texas, and Wisconsin. Whether this potentially dangerous race has become established outside northeastern United States, however, remains to be seen. Significantly, a new and dangerous subrace, provisionally designated 13A, was isolated from a uredial collection made in New York. This is the most virulent culture of oat stem rust now known in the United States and can attack all commercially grown varieties of oats.

D. Eradication or control

Rust-spreading barberry plants are found by the farmstead type of inspection or by employing the intensive method of scouting.

The farmstead work involves a systematic foot scouting of yards, orchards, wood lots, and fence rows on the sites of, and immediately adjacent to, occupied or abandoned farm dwellings, cemeteries, school yards, rural industrial areas, and planted groves. Cities and towns are scouted systematically if they fall within an area selected for the farmstead work. This type of inspection is used primarily on initial work to establish the pattern of barberry distribution. During the year, farmstead work was completed in areas totaling 340 square miles in Missouri and 1,687 square miles in Kansas.

The intensive work involves the systematic foot scouting of all natural and planted timber and all other uncultivated areas, including fence rows, stream banks, yards, orchards, and wood lots

in rural and urban areas. This method is employed where there are known escaped bushes. A total of 2,418 square miles was given this type of inspection during the year.

The ultimate goal of the barberry-eradication work is to place all the territory on a maintenance basis. These areas will then require only sufficient work in the future to hold the high degree of barberry- and stem-rust control that has been attained. This is done through quarantine enforcement and nursery inspection, educational activities, studies of seasonal rust development, and periodic inspection of areas where bushes have been found. There is at the end of the year an area of 634,105 square miles where the maintenance program is in effect.

In most of the barberry-infested areas in this region, the barberries are pretty well scattered. These bushes are effectively destroyed with Ammate (ammonium sulfamate) by applying the chemical to cut-off canes at the ground level. However, there still remain in Ohio a number of areas where bushes are sufficiently numerous that the application of the hormone type of chemical is the most practical eradicant. In these areas an oil solution of MCP or Brush Killer 32-P is used by thoroughly spraying the basal stems and drenching the ground immediately around the plants.

During the year, 4,762 square miles were inspected and 16,104 barberries were destroyed on 235 new and 550 previously infested properties. As a result of the field activities, 4,106 square miles were placed on maintenance and 1,822 previously infested properties were relegated to the inactive category.

E. Regulatory

Provisions of the Federal Stem Rust Quarantine No. 38 regulate the interstate movement of all species and varieties of barberry, mahonia, and mahoberberis plants, fruits, and seeds. Only plants of the species and varieties that have been tested for reaction to stem rust and found to be immune or highly resistant are permitted to move interstate.

Each year all establishments that made application for permit to ship barberry and mahonia interstate are inspected. Inspections are made to determine if applicants are complying with the provisions of the quarantine: i.e., barberry and mahonia are properly labeled, plants are true-to-type, and rust-susceptible plants are not being propagated. This year 204 nurseries and 36 dealers were approved and issued certificates permitting interstate shipment of barberry and mahonia plants. These growers had an inventory of more than $5\frac{1}{2}$ million plants that were inspected.

All states in the Central Region, except Kentucky, participate in the active barberry-eradication program. These states have

regulations parallel to the Federal quarantine which governs the intrastate movement of barberry and mahonia.

During the year, rust-susceptibility tests resulted in the approval of six additional species, varieties, and hybrids that may be moved in accordance with the provisions of the quarantine. Four others require additional testing. There are now on the approved list 63 berberis, 3 mahoberberis, and 8 mahonia.

Tests were completed on the following six barberries: Berberis cavallieri, B. coxii, B. dubia, B. gladwynensis, B. taliensis, and B. thunbergi argenteo marginata. Of these, four came from arboretums and two from commercial nurseries.

F. Methods improvement

There has been no material change in the procedures and techniques in operations of the barberry-eradication program.

G. Other

The principal cooperators of the barberry-eradication program are: State Departments of Agriculture and Conservation, State Extension Services, State Experiment Stations, the Rust Prevention Association, and farm operators.

The states, through the Chiefs of Plant Industry or the State Entomologists, participate in joint planning and direction of the operations program. Extension Service personnel assist with the informational activities and in recruiting local field workers. State Experiment Stations provide office, greenhouse, and storage space, and station personnel assist with the epidemiology phase of the program. The Rust Prevention Association provides invaluable information concerning crop and rust development during the season, and assists with the informational activities. This organization also is actively interested in the financing of the program at the State and Federal level. Farm operators provide storage for equipment and chemicals, and in some instances assist in the actual field operations. They also destroy on their own initiative bushes that they find on their properties.

The assistance and cooperation of participating agencies and individuals have been satisfactory.

The program services to farmers and agricultural organizations were conducted principally through the facilities of, and in cooperation with, the Extension specialists, county agents, and the publicity division of the State Departments of Agriculture. The Division provided informational data and exhibit materials and assisted in disseminating them to farmers, property owners, and agricultural agencies.

Division personnel discussed program activities informally at 10 farm and civic group meetings, crop shows, college and high school agriculture and science classes. Copies of the sound film, "Stem Rust--Airborne Enemy of Grain," assigned to the agriculture film libraries in most states, reported the film used 195 times, and Division personnel used the same film on 24 occasions. Cooperating and Division personnel participated in 57 radio and TV presentations.

Other means of disseminating information were the publishing of 26 feature and news stories and the distribution of 22,961 bulletins and circulars. Exhibits were placed at 19 fairs, crop shows, and other agricultural gatherings.

The Extension Service in Michigan released a revised edition of a State barberry circular for use in that state. The Barberry Eradication Nursery Inspection Manual was revised and copies made available prior to the inspection season. This publication is an important tool to personnel assigned to inspections as required under the provisions of Quarantine 38. It was particularly important this year as many inspectors without previous experience were given training in this activity.

III. RECOMMENDATIONS FOR COMING YEAR

The barberry-eradication program is dependent upon long-range planning. Rework must be done at the proper time to eradicate bushes before seed production and subsequent reinfestation occurs. An adequate maintenance program is essential to maintain a barberry-free condition in areas cleared of bushes. It is recommended that the over-all program continue approximately on the same basis at least for the next two years.

Some adjustment should be made in Ohio to increase the manpower in order to complete the scheduled rework for the 1959 fiscal year. A total of 1,200 square miles in 14 counties is scheduled for rework in that state. Areas in some of these counties consist of large wood lots and rugged terrain that should be reworked by 4- or 5-man units. The adjustment can be made by reducing operations in other states and temporarily increasing the manpower in the more troublesome infestations in Ohio.

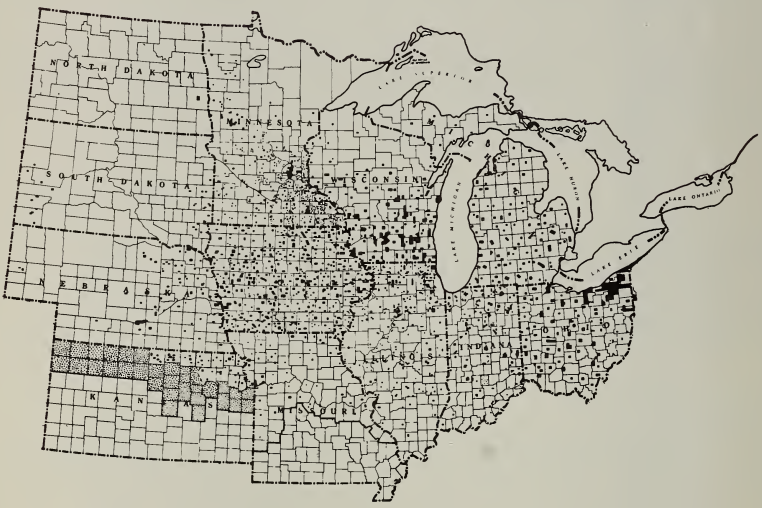
Survey, regulatory, and associated activities will be conducted in the same manner as in the past. These phases of the stem-rust control activity follow a well-established pattern, with little or no deviation from the procedures used in previous years. If necessary, minor adjustments can be made in these activities without affecting the over-all operation.

Table 2 - Barberry Eradication Accomplishments - Fiscal Year 1958

State	Square Miles Worked		Properties Found Infested		Number Old Props. Inspected	Bushes Destroyed		Inspections	
	Initial	Rework	New Props.	Old Props.		Vulgaris	Native	Nursery	Dealer
Illinois	0	28	1	8	77	15	0	31	6
Indiana	0	41	1	11	163	42	0	8	0
Iowa	0	1,072	29	71	646	976	0	7	3
Kansas	1,687	0	28	5	32	309	0	7	0
Kentucky	0	0	0	0	0	0	0	11	0
Michigan	0	444	94	198	1,070	5,823	0	22	3
Minnesota	0	158	37	37	333	453	0	22	10
Missouri	340	18	0	1	52	8	0	10	11
Nebraska	0	160	7	1	131	14	0	2	0
North Dakota	0	14	0	1	16	3	0	1	0
Ohio	0	404	7	81	909	7,507	0	73	1
South Dakota	0	37	0	1	11	1	0	1	0
Wisconsin	0	359	31	135	618	953	0	9	2
Totals	2,027	2,735	235	550	4,058	16,104	0	204	36

BARBERRY ERADICATION
CENTRAL REGION

STATUS JULY 1, 1958



Area requiring intensive work	16,725	square miles
Area requiring farmstead work	25,690	square miles
Area on maintenance	634,105	square miles

PRESENT STATUS, PROGRESS, AND FUTURE REQUIREMENTS, 1918-1958

State	Square Miles										Properties				Barberry Bushes Destroyed		
	Total in State to be Worked	Number Covered				Number Requiring Work One or More Times				No. Requiring Work	Total Found to Date	No. Needing One or More Inspections	Number Completed		Common	Native	Total to Date
		Initial Work		Rework		Farmstead		Intensive									
		Farmstead	Intensive	Farmstead	Intensive	Initial	Rework	Initial	Rework	No Future Work							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		(15)	(16)	(17)
Illinois	56,043	56,043	34,679	4,659	7,727	0	0	0	727	55,316	20,051	2,896	17,155		2,660,236	89,781	2,750,017
Indiana	36,045	36,045	27,329	8,405	3,450	0	299	14	250	35,482	7,012	841	6,171		200,018	211,715	411,733
Iowa	56,167	56,167	44,477	4,279	10,544	0	714	304	4,749	50,400	15,796	5,112	10,684		1,321,076	125	1,321,201
Kansas	32,800	8,123	0	0	0	24,677	0	0	193	7,930	215	215	0		1,767	0	1,767
Michigan	57,481	57,481	26,637	17,096	10,227	0	0	19	1,452	56,010	19,126	5,021	14,105		6,715,145	16	6,715,161
Minnesota	80,883	80,883	32,958	28,742	7,669	0	0	0	1,866	79,017	9,304	2,575	6,729		1,013,414	0	1,013,414
Missouri	37,190	19,724	17,641	789	909	0	0	34	220	36,936	1,915	724	1,191		24,552	0	24,552
Nebraska	77,268	77,268	36,832	34,966	7,179	0	0	0	541	76,727	4,936	215	4,721		149,007	0	149,007
North Dakota	70,183	70,183	1,276	30,105	416	0	0	0	21	70,162	1,084	12	1,072		39,560	0	39,560
Ohio	40,740	40,740	32,197	6,289	11,703	0	0	0	2,983	37,757	17,619	3,180	14,439		3,786,628	0	3,786,628
South Dakota	76,868	76,868	12,906	4,523	1,470	0	0	0	208	76,660	1,570	83	1,487		136,438	0	136,438
Wisconsin	54,852	54,852	21,304	23,886	10,470	0	0	0	3,144	51,708	17,982	6,450	11,532		5,716,956	0	5,716,956
Totals	676,520	634,377	288,236	163,739	71,764	24,677	1,013	371	16,354	634,105	116,610	27,324	89,286		21,764,797	301,637	22,066,434

Summary of Associated Activities - Fiscal Year 1958

State	Public Meetings Attended	Presentations: Talks	Presentations: Slides	Presentations: Films	Presentations: Radio	Presentations: TV	Feature & News Stories*	Extent These Aids Were Used**: Exhibits	Bulletins	Circulars	Infest. Maps & Posters	Other
FEDERAL												
Illinois	1	1	1	-	-	-	-	-	-	50	-	1
Indiana	-	-	-	-	-	-	-	-	-	10	-	-
Iowa	2	2	1	-	-	-	-	-	3,180	300	10	1
Kansas	-	-	-	1	1	-	5	5	-	6,120	-	-
Kentucky	-	1	-	-	-	-	-	-	-	-	-	-
Michigan	-	1	1	2	-	-	4	3	4,125	640	-	1
Minnesota	-	-	-	-	-	-	-	1	308	1,457	158	119***
Rust Lab.	-	-	-	-	-	-	5	-	-	-	-	-
Mpls. Office	4	4	-	11	-	-	4	-	21	-	-	-
Missouri	1	1	-	-	-	-	-	-	100	50	-	1
Nebraska	-	8	-	8	-	-	-	1	-	1,700	4	-
N. Dakota	-	-	-	-	-	-	-	-	50	50	-	-
Ohio	2	4	-	2	-	-	1	3	3,500	-	-	-
S. Dakota	-	-	-	-	-	-	-	-	-	500	-	-
Wisconsin	-	-	-	-	43	-	-	-	75	625	-	500****
Subtotals	10	22	3	24	44	-	19	13	11,359	11,502	172	623
COOPERATORS												
Illinois	-	7	-	7	-	-	-	-	-	100	18	-
Indiana	-	11	-	11	-	-	-	-	-	-	-	-
Iowa	3	3	3	14	1	1	3	-	-	-	-	-
Kansas	-	1	-	1	-	-	-	1	-	-	-	-
Michigan	-	12	-	24	4	1	4	-	-	-	-	-
Minnesota	-	-	-	58	-	-	-	-	-	-	-	-
Missouri	-	-	-	8	-	-	-	-	-	-	-	-
Nebraska	-	18	-	17	-	-	-	1	-	-	-	-
N. Dakota	1	1	-	-	4	2	-	-	-	-	-	-
Ohio	2	-	-	25	-	-	-	-	-	-	-	-
S. Dakota	14	14	14	14	-	-	-	4	-	-	-	-
Wisconsin	-	-	-	16	-	-	-	-	-	-	-	-
Subtotals	20	67	17	195	9	4	7	6	-	100	18	-
GRAND TOTALS	30	89	20	219	53	4	26	19	11,359	11,602	190	623

*Written by Federal personnel for release direct or through cooperators. **Conservative estimate.
***Slide sets. ****Includes barberry specimens, infected straw, and microscope slides.

Cooperative Aid Received - Fiscal Year 1958

State	Cash and Equivalent Aid*				Total of Cash & Equiv.*	Intangible Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Illinois	$ 1,223	$ 0	$ 0	$ 0	$ 1,223	$ 4,000	$ 5,223
Indiana	7,486	0	0	0	7,486	2,000	9,486
Iowa	4,597	0	0	2,400	6,997	5,700	12,697
Kansas	5,072	0	0	0	5,072	2,000	7,072
Kentucky	0	0	0	0	0	0	0
Michigan	17,326	20,451	14	1,200	38,991	4,500	43,491
Minnesota	17,426	200	0	1,127	18,753	7,300	26,053
Missouri	3,060	0	0	240	3,300	2,700	6,000
Nebraska	6,127	0	720	0	6,847	2,000	8,847
North Dakota	3,085	1,350	0	360	4,795	390	5,185
Ohio	14,682	200	0	292	15,174	5,000	20,174
South Dakota	6,891	1,160	0	60	8,111	780	8,891
Wisconsin	14,462	0	0	2,100	16,562	3,900	20,462
Totals	101,437	23,361	734	7,779	133,311	40,270	173,581***

*Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available.

***Does not include contributed services, Cooperative Rust Laboratory, valued at $4,203, and Rust Prevention Association, $34,000.

Barberry Eradication Expenditures by Source and by Activity - Fiscal Year 1958

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
CASH & EQUIVALENT*								
PPC Division	$32,905	$ 8,195	$33,475	$306,170	$11,755	$605	$ 2,220	$395,325
Other Organizations:								
Illinois	0	0	0	1,223	0	0	0	1,223
Indiana	0	0	0	7,486	0	0	0	7,486
Iowa	0	0	0	4,597	0	0	2,400	6,997
Kansas	0	0	0	5,072	0	0	0	5,072
Michigan	0	0	200	37,577	0	0	1,214	38,991
Minnesota	0	0	0	17,426	0	0	1,327	18,753
Missouri	0	0	0	3,060	0	0	240	3,300
Nebraska	0	0	0	6,127	0	0	720	6,847
North Dakota	585	1,000	1,000	500	0	0	0	3,085
Ohio	0	0	0	15,174	0	0	0	15,174
South Dakota	891	3,000	2,000	1,000	0	0	0	6,891
Wisconsin	0	0	0	14,462	0	0	2,100	16,562
Subtotals	$ 1,476	$4,000	$3,200	$113,704	0	0	$8,001	$130,381
CONTRIBUTED SERVICES**								
Illinois	0	2,000	0	0	2,000	0	0	4,000
Indiana	0	1,000	0	0	1,000	0	0	2,000
Iowa	100	4,000	500	0	1,100	0	0	5,700
Kansas	0	1,500	0	0	500	0	0	2,000
Michigan	300	1,300	200	0	2,700	0	0	4,500
Minnesota	200	800	200	3,800	2,300	0	0	7,300
Missouri	200	1,200	0	0	1,300	0	0	2,700
Nebraska	0	1,500	0	0	500	0	0	2,000
North Dakota	0	1,000	140	0	600	0	360	2,100
Ohio	400	1,800	400	0	2,400	0	0	5,000
South Dakota	100	1,000	200	0	400	0	300	2,000
Wisconsin	0	1,500	0	0	2,400	0	0	3,900
Subtotals	1,300	18,600	1,640	3,800	17,200	0	660	43,200***
GRAND TOTALS	35,681	30,795	38,315	423,674	28,955	605	$10,881	$568,906

*Direct approp., allotments other sources, services & supplies for which there is actual cash expenditure.
**Services incidental to other activities, for which only an estimated value is available.
***Does not include contributed services Cooperative Rust Laboratory, valued at 4,203, and Rust Prevention Association, $34,000.0

(* - - *)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

BARBERRY ERADICATION

July 1, 1957 - June 30, 1958

COOPERATING AGENCIES:

Plant Pest Control Division, Agricultural Research
Service, U. S. Department of Agriculture
In cooperation with
State, County, and Local Agencies

November 1958
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

TABLE OF CONTENTS

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

Barberry eradication for control of stem rust of cereal grains was continued in Pennsylvania and the Virginias at about the same level of operations as that for the past several years. Efforts of all cooperating agencies resulted in the eradication of 1,880,427 rust spreading barberries. To accomplish this eradication, crews intensively reworked 722 square miles of territory determined to be subject to reinfestation. In addition, initial work by farmstead and intensive methods was done on 747 square miles. In the areas worked it was possible to inactivate 734 of the 1,469 square miles covered.

Federal and State quarantines were enforced throughout the year to prevent reinfestation by susceptible barberries of areas that have been cleared.

B. Major deviation from Work Plan

(Not Applicable)

C. Status of Program at Close of Year

As of June 30, 1958, a total of 30,891 square miles of the original 44,469 square miles of small grain producing territory scheduled for survey and eradication in the three eradication states, had been completed and relegated to the maintenance category. In the remaining 13,578 square miles initial work is required on 7,564 square miles, and rework on 6,014 square miles. For details refer to Map #1 and Table #2.

II. Program Activity During Fiscal Year

A. Planning and Direction

Work plans for activities during the year were developed jointly by PPC Station Supervisors and officials of cooperating state and county agencies. Field activities were under the general direction of PPC Station Supervisors and direct supervision by District Supervisors. The annual nursery inspection program was planned by the Regional Supervisor in cooperation with the Regional Supervisor of the Central Region. In the non-eradication states, these inspections were conducted by selected local inspectors under the direction of the Central Regional Regulatory Assistant.

B. Technical Assistance

1. Program personnel provided information to farmers and property owners concerning the importance of barberry eradication; taught them to recognize rust spreading barberry bushes and stem rust infection; demonstrated proper eradication procedure; and encouraged owners to destroy rust spreading barberries observed on their properties.

2. Plant Pathology and Extension specialists discussed barberry eradication at meetings of growers at the county level. They also advised program personnel of barberries and rust infections observed or reported to them. County agents assisted in recruiting local workers and providing news coverage about progress made.

C. Survey

1. Two types of surveys are made as a part of the stem rust control program. First, periodic checks or surveys are made in areas needing rework to determine the optimum dates for rework to be done. Second, rust surveys are made during season throughout the small grain growing areas to observe and record prevalence and severity of infection and to make collections of infection for physiologic race study.

   Surveys are coupled with eradication - bushes are destroyed as they are found. Barberries are located by systematic foot scouting of areas where bushes are most likely to be found.

   Annual rust surveys and observations are made in all principal grain producing areas. During the rust season collections of infected barberries, grains and grasses are made and forwarded to the Cooperative Rust Laboratory at St. Paul for physiologic race determinations. The combined surveys, rust observations and collections provide the necessary data to estimate damage caused by the disease.

2. Observations were made in all important small grain growing areas for occurrence and severity of rust infection, and more than 200 infected specimens were submitted to the laboratory for race determinations. Initial infection in most areas was later than average on both hosts as of June 30, 1958, with infection on small grain considered very light, suggesting very little damage from rust.

3. Losses to stem rust in the three eradication states is estimated as follows:

	Wheat	Oats	Barley	Rye
Pennsylvania	Tr.	Tr.	0	0
Virginia	1%	.5%	Tr.	Tr.
W. Virginia	1%	.5%	Tr.	Tr.

D. Eradication or Control

1. At the present status of the program, priority is given to rework requirements in order to prevent reinfestation of worked areas, and all additional resources are devoted to work in initial territory. Initial or farmstead type coverage involves the scouting of planting sites to locate and destroy introduced barberries from which infestation may originate. When introduced plantings are found, a close intensive coverage of adjacent environs is made to locate any wild bushes stemming from such sources. Rework involves intensive type coverage which requires a close foot scouting of all uncultivated territory, subject to infestation, that will support barberry growth. Infested areas are cleared by periodic inspections until no regrowth is found.

   Barberries are eradicated by application of chemicals. Ammonium sulfamate, "ammate", applied as dry salt to the fresh surface of canes cut at the ground line is effective. Also, hormone type herbicide, Brush Killer 32P applied as a basal spray to B. Vulgaris or as a foliage-basal spray to B. canadensis is used extensively in areas of profuse growth.

2. In Pennsylvania, 38,194 barberry bushes were destroyed on 796 old and 184 new farms. In addition, 1,044 previously infested properties were checked with negative results. A total of 65 properties were relegated to the inactive files, and 366 square miles of territory were placed in maintenance status.

   In Virginia, 811 properties were inspected and 1,378,759 bushes were eradicated from 531 properties, in a surveyed area of 388 square miles. Of the properties worked, 165 were placed on maintenance on the basis of two successive negative surveys.

   In West Virginia, 96 properties were inspected and 463,474 bushes destroyed from 80 properties, in a surveyed area of 241 square miles. Eight properties were placed on maintenance on the basis of two successive negative surveys.

E. Regulatory

1. The Federal Black Stem Rust Quarantine No. 38 regulates the interstate movement of all species and varieties of barberry, mahoberberis, and mahonia plants; and regulates the movement of fruits and seeds within the boundaries of the 19 eradication states. Only rust resistant species and varieties as listed in administrative instructions, may be shipped interstate under a certificate of inspection issued annually. Interstate shipments of rust-resistant fruit and seed require a special permit which must accompany the shipment. All nurseries and dealers engaged in interstate movement of this regulated plant material are inspected annually and issued certificates after determination by an inspector that no plants other than those which are rust resistant are growing in the nursery or its environs. If rust susceptible plants are found certificates are withheld until such plants have been eliminated from the nursery.

   State quarantines closely paralleling the Federal quarantine regulate the intrastate movement of rust spreading varieties of Berberris.

   Post-entry barberry and mahonia being held under detention are also inspected for trueness to type and proper labelling. Such stock is held until released by the Foreign Plant Quarantin and State regulatory officials.

2. This year, 121 nurseries and 24 dealers were inspected and approved to ship plants in conformance with provisions of the quarantine.

F. Methods Improvement

1. Screening tests of new herbicides were conducted, and field tests with new combinations of currently used herbicides were continued. Efforts were also made to improve survey procedures and territory analyses.

G. Other

1. Cooperation received during fiscal year

   Cooperating State Departments of Agriculture actively participated in planning and direction of the work; provided funds for matching expenditures of counties; provided additional assistanc in manpower, equipment and supplies; and enforced State Quarantines. Local commissioners appropriated funds for the eradication of barberries within confines of their counties. County agents assisted with local employment problems, arranged for publicity over radios, television and newspapers and participated in discussions with county commissioners. Botany and

Plant Pathology Departments and Experiment Stations of State Universities advised on technical problems related to susceptibility of varieties of small grains, made rust observations, and disseminated information.

2. Associated Activities

Stem rust control was discussed informally at 75 meetings with growers, university and high school classes and other interested groups. Newspaper articles were prepared for use in seven local publications. Program service displays were placed at nine State meetings or local fairs and one television presentation was made. See Table #3.

III. Recommendations for Coming Year

A. Survey

Preliminary to intensive inspections, continue reconnaissance surveys to determine status of infestation and need for rework.

Continue rust surveys to observe rust development, prevalence and severity and damage caused. Collect samples of infested grain and barberry plants for race determination.

B. Eradication

Complete scheduled initial coverage as rapidly as possible and follow up with interim rework to locate and destroy all barberry bushes before they reach the fruiting stage.

C. Regulatory

Continue the annual inspection of nurseries and dealers to determine compliance with provisions of the quarantine.

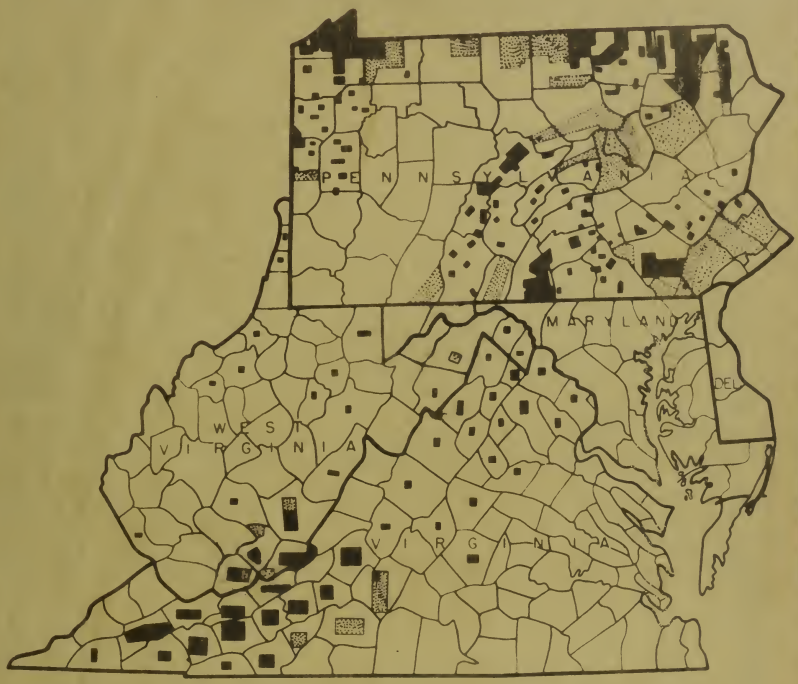
D. Methods Improvement

Continue tests to develop and improve chemical eradication treatments, including the screening of new herbicides and field testing those showing good barberry killing qualities. Efforts to improve survey and eradication procedures should also be continued.

E. Associated Activities

Stem-rust control will be discussed at farmer and civic group meetings. Exhibits will be placed at fairs, farmer gatherings and service meetings. Items of program information will be provided upon request.

BARBERRY ERADICATION
EASTERN REGION
STATUS JULY 1, 1958



AREA REQUIRING INTENSIVE WORK	6,014 SQ. MILES
AREA REQUIRING FARMSTEAD WORK	7,564 SQ. MILES
AREA ON MAINTENANCE	30,891 SQ. MILES
AND AREA REQUIRING NO WORK PRESENTLY (APPROX.)	64,565 SQ. MILES

BARBERRY

TABLE #1

EASTERN REGION

FISCAL YEAR 1956

STATE A	SQUARE MILES WORKED		PROPERTIES FOUND INFESTED		OLD PROPERTIES INSPECTED	BARBERRY BUSHES DESTROYED		INSPECTIONS	
	Initial B	Rework C	New D	Old E	F	Common G	Native H	Nursery I	Dealer
Pennsylvania	420	458	184	796	1840	38194	0	21	3
Virginia	146	242	40	491	771	9	1378750	16	
West Virginia	181	60	6	74	90	24	463450	4	
Massachusetts								4	
Rhode Island								3	
Connecticut								9	
New York								23	13
New Jersey								23	4
Maryland								8	2
Delaware								9	
District of Columbia								1	2
Total	747	760	230	1361	2701	38227	1842200	121	24
Total from beginning of Program	36955	12092	19264	16837	33635	15375346	402003656		

On December and June reports show: Square miles placed on maintenance since July 1, 734; since beginning of program 30891; properties made inactive 2137.

PPC 7-1

TABLE #2

Eastern Region

BARBERRY ERADICATION

Fiscal Year 1958

PRESENT STATUS, PROGRESS, AND FUTURE REQUIREMENTS, 1934-1957

State	Total in State to be Worked	Number Covered				Number Requiring Work One or More Times				No. Requiring No Future Work
		Initial Work		Rework		Farmstead		Intensive		
		Farmstead	Intensive	Farmstead	Intensive	Initial	Rework	Initial	Rework	
Pennsylvania	26,256	10,213	9,952	0	6,211	6,023	0	70	4,270	15,893
Virginia	12,532	8,028	3,146	10	3,876	529	0	829	1,181	9,993
W. Virginia	5,681	3,529	2,039	143	1,744	0	117	113	446	5,005
Totals	44,469	21,770	15,137	153	11,831	6,552	117	1,012	5,897	30,891

State	Properties			Barberries Destroyed to Date
	Total Found to Date	No Needing One or More Reinspections	Number Completed	
Pennsylvania	12,037	11,189	848	15,329,487
Virginia	4,980	3,840	1,140	222,116,658
W. Virginia	2,247	2,097	150	179,932,857
Totals	19,264	17,126	2,138	417,379,002

TABLE #3

SUMMARY OF ASSOCIATED ACTIVITIES

EASTERN REGION

Fiscal Year 1958

State	Public Meetings Attended	Presentations					Feature & News Stories	Extent these Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.	Cir.	Infest.Maps & Posters	
Pennsylvania	-	20	3	10	-	1	4	7	1,000		51	-
Virginia	-	42	2	50	-	-	2	2	145	935	100	-
West Virginia	-	12	2	16	-	-	1	-	40	145	32	-
Totals	-	74	7	76	-	1	7	9	1,185	1,080	183	

BARBERRY ERADICATION

* * *

PROGRAM ANNUAL REPORT
1966 FISCAL YEAR

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BARBERRY ERADICATION

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PROGRAM ANNUAL REPORT
1958 FISCAL YEAR

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

BARBERRY ERADICATION

July 1, 1957 - June 30, 1958

Cooperating Agencies:

State Departments of Agriculture
State College Experiment Stations
and Extension Services
Counties and Individuals
in States of:
Colorado
Montana
Washington
Wyoming

October 30, 1958
Oakland, California

Jim R. Dutton
Regional Supervisor

TABLE OF CONTENTS

HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishments for the Fiscal Year

During the year, State and Federal workers inspected areas totaling 257 square miles for rust-susceptible barberries. Inspection was accomplished in Colorado, Montana, and Washington, and was rework of areas previously infested. A total of 989,007 barberry bushes was destroyed on 7 new and 542 previously infested properties. With the completion of this year's work, 3 Colorado Counties--[redacted], Rio Grande, Costilla, and Conejos--were placed on maintenance.

Increased incidence of stem rust in northeastern Oregon Counties this year greatly accelerated Oregon's interest in a cooperative eradication program. Several meetings were held and some demonstration work done, but at the close of the year, no actual program developed.

Major Deviation from Work Plan

There were only minor deviations from the planned work schedule, principally in Colorado where a greatly expanded Grasshopper Program developed and in Washington, where personnel were assigned temporarily to Rhododendron Rust. However, these emergency assignments of personnel did not materially affect the anticipated progress of barberry work in either State.

Status of Program at Close of Year

The areas originally requiring work amounted to 345,360 square miles. At the close of this current year, there remained only 100 square miles requiring intensive initial work, 20 square miles rework by the farmstead method, and 1,045 square miles intensive rework. As evidenced by the small amount of area remaining to be surveyed, one can readily see that a great deal has been accomplished in eradicating barberry to date.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

Barberry eradication in the States concerned was conducted in accordance with plans developed and agreed upon by the Division personnel and responsible State officials. Plant Pest Control Supervisors directed program activities in their respective States, after frequent consultations with officials of the cooperating agencies.

Technical Assistance

Division personnel worked with farmers, vocational agricultural classes, and County Agents, demonstrating barberry survey and eradication procedures.

Heavier than normal incidence of stem rust in principal wheat growing areas of Oregon, Washington, and Idaho required additional technical direction in performance of rust surveys, especially in eastern Oregon where farmer groups and County Agents requested aid in developing a cooperative barberry eradication program.

State Plant Pathologists and Extension specialists provided information to farmer groups regarding the importance of barberry eradication to stem rust control. They also assisted in obtaining data on the development of stem rust during the growing season, and provided general leadership for the program.

Survey

Prior to planning field operations for the year, contacts with State and county officials are made in conjunction with preliminary field surveys and observations to determine areas to be worked, the type and extent of work to be done, manpower, material, and equipment needs.

Annual stem rust surveys of all major grain growing areas were made to observe rust development, extent and severity of damage. Collections of rusted grain plants and infected barberry leaves were made and sent to the Cooperative Rust Laboratory at Minneapolis and to State Experiment Stations for race determination.

Stem rust damage to small grains in 1957 in Wyoming, Colorado, and Montana was negligible with only small areas in Ravalli County, Montana, being found infected. Stem rust was present in eastern Washington over a much larger territory than at any time in the past ten years.

In the higher rainfall area of southeastern Washington, late winter wheat and much spring wheat developed rather heavy infection. Apparently, there was a late spore showering from some rather distant source, probably northeastern Oregon, where barberry were known to be heavily infected. Moderate local losses were suffered, but in general, the stem rust was too late to cause major damage.

Northern Idaho Counties were spot checked during 1958 and the incidence of stem rust was high. Although no reliable estimates of crop losses were made, it is assumed that damage was excessive.

Perhaps crop losses were greater in northeastern Oregon Counties than anywhere else in the Region.

Eradication or Control

Rust-spreading barberry plants are located by employing the farmstead type of inspection or by the intensive method. A large portion of the 4-State area is on maintenance and rework is accomplished with State personnel checking areas in an effort to assure and maintain barberry control.

Intensive work involves foot scouting of all uncultivated areas including timber lands, fence rows, wood lots, river and creek banks in rural and urban areas where they are known to have or are suspected of having barberry bushes.

Farmstead work involves systematic foot scouting of residential property--city and rural--cemeteries, school yards, industrial sites, etc. This type of inspection for barberry is used on initial work, and results from this can determine the pattern to be followed in survey-in the remaining area.

At the close of the fiscal year, Wyoming, Montana, and all but four counties in Colorado, were on maintenance. Rework surveys were conducted in two Washington Counties with a total of 141 square miles intensively foot-scouted.

Regulatory

The Federal Stem Rust Quarantine No. 38 provides for the regulation of interstate movement of all species and varieties of barberry, mahonia, and mahoberberis plants, fruits and seeds. Species and varieties of plants which have been tested for reaction to stem rust and prove to be immune or highly resistant are permitted to move interstate.

Inspections of all nurseries which have applied for a permit to ship barberry and mahonia interstate are made each year by State and Federal personnel to determine if they are complying with the provisions of the quarantine.

This year 2 dealers and 77 nurseries were inspected--their combined inventory was 216,554 barberry bushes, 1,251,502 mahonia plants, and 300 restricted seedlings.

Methods Improvement

Accepted methods of procedures and techniques now employed seem adequate for the efficient conduct of the program.

Other

Principal cooperators are the State Departments of Agriculture, State Entension Services, State Experiment Stations, and growers.

The major share of State cooperative funds provided is by the State Department of Agriculture in the several States participating. The States, through the Chiefs of Plant Industry or the State Entomologists, participate in the joint planning of the field operations. Assistance in nursery inspection is also provided by the State Departments of Agriculture. Extension Service personnel provide a great deal of assistance in disseminating literature on barberry control and stem rust data. The Experiment Station, Washington State College, provides office, storage, greenhouse and laboratory space. Some counties furnish funds, equipment, supplies and labor for work in their areas. Invaluable aid also is received each year from the Rust Prevention Association, Minneapolis, Minnesota, which promotes barberry eradication and stem rust control on a broad basis throughout the United States. Special mention must also be made of the assistance and guidance given us by the Central Plant Pest Control Region.

The revised Barberry Eradication Nursery Inspection Manual was received, and copies made available to Plant Pest Control and cooperating inspectors prior to the inspection season.

Numerous circulars were distributed in Washington, Oregon, and Colorado. Two exhibits were placed--one in connection with Agronomy Day at Washington State College, the other in Colorado.

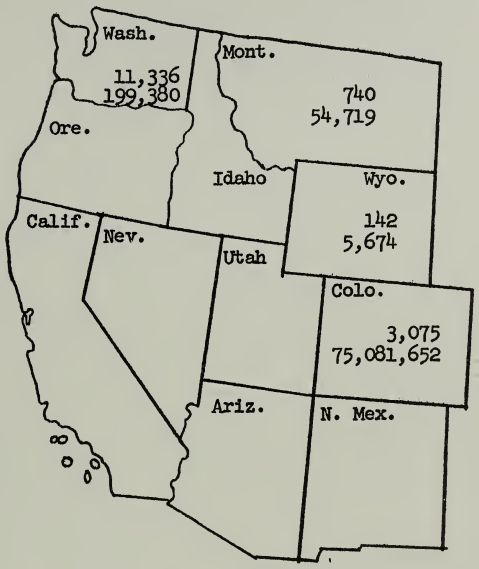
RECOMMENDATIONS FOR COMING YEAR

Long-range planning is essential in barberry eradication, and has been well developed and executed in the past. Adequate maintenance must be followed to maintain a barberry-free condition in areas cleared of bushes. Initial surveys and rework surveys must be done systematically and on schedule to eradicate bushes before they produce seed. The present level of work should be maintained in Montana and Wyoming. By the close of the coming year, Colorado can possibly look forward to placing the remaining barberry work area on maintenance. Washington should maintain its present level of field work; however,

some studies should be made as to prevalence and location of overwintering uredial spores. Further technical assistance will be offered to Oregon.

There are very few changes contemplated, and all phases of barberry work, survey, regulatory, and eradication will continue as in the past, with but minor deviation or adjustments as conditions demand without affecting the over-all plan to any great degree.

STATES COOPERATING IN THE BARBERRY ERADICATION PROGRAM
FOR CONTROL OF STEM RUST, 1918 - 1958



Upper Figure: Properties Cleared of Barberry Bushes

Lower Figure: Barberry Bushes and Seedlings Destroyed

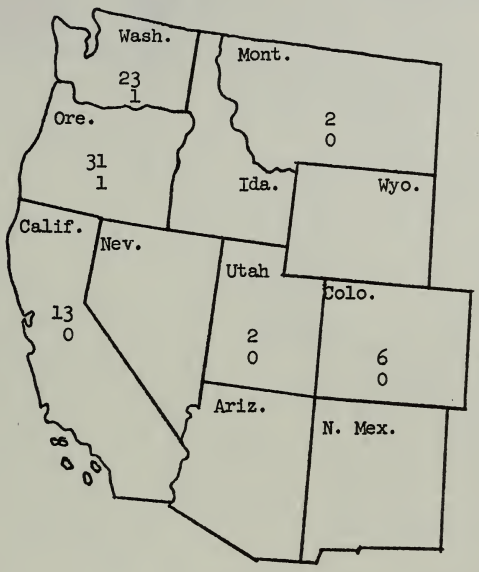
Summarized Results

Properties Cleared 15,293

Bushes and Seedings Destroyed 75,341,425

GROWERS AND DEALERS AUTHORIZED TO SHIP BARBERRIES AND MAHONIA INTERSTATE IN CONFORMANCE WITH THE PROVISIONS OF QUARANTINE 38

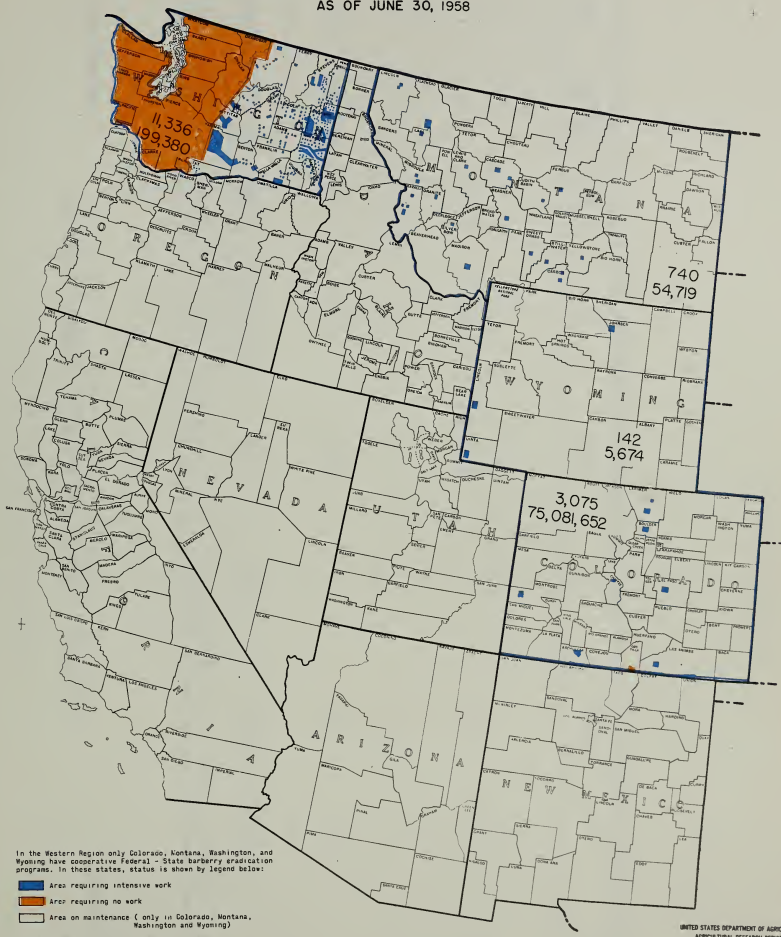
Fiscal Year 1958



LEGEND	TOTAL
Upper Number - Nurseries	77
Lower Number - Dealers	2
Total plants inspected	1,468,356

BARBERRY ERADICATION

AS OF JUNE 30, 1958



In the Western Region only Colorado, Montana, Washington, and Wyoming have cooperative Federal - State barberry eradication programs. In these states, status is shown by legend below:

Area requiring intensive work

Area requiring no work

Area on maintenance (only in Colorado, Montana, Washington and Wyoming)

UPPER FIGURE: Properties cleared barberry bushes

LOWER FIGURE: Barberry bushes and seedlings destroyed

SUMMARIZED RESULTS:
Properties cleared - 15,293

Bushes and seedlings destroyed - 75,341,425

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

GPO 977337

Barberry Eradication

PROPERTIES CLEARED AND BARBERRY BUSHES DESTROYED

Fiscal Year 1958

State	Square Miles Worked		Properties Found Infested		Old Properties Inspected	Bushes Destroyed		Inspections	
	Initial	Rework	New	Old		Common	Native	Nursery	Dealer
California	0	0	0	0	0	0	0	11	1
Colorado	0	100	0	127	140	80	985,819	210	0
Montana	0	16.25	0	3	108	5	0	3	2
Oregon	0	0	0	0	0	0	0	32	1
Washington	0	141	6	106	530	3,103	0	22	1
Wyoming	0	0	0	0	5	0	0	0	0
Totals	0	257.25	6	236	783	3,188	985,819	278	5

SUMMARY OF ASSOCIATED ACTIVITIES

Barberry Eradication

Fiscal Year 1958

Area	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.*	Infest.Maps and Posters	
Colorado	2	3	1	1	0	0	1	1	100	100	0	0
Montana	0	0	0	0	0	0	0	0	0	0	0	0
Washington	1	0	0	1	0	0	4	1	0	300	5	0
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0
Totals	3	3	1	2	0	0	5	2	100	400	5	0

*Written By Federal personnel for release direct or through cooperators.

SUMMARY OF NURSERY INSPECTIONS - 1958

Barberry Eradication

Total number of nurseries doing interstate business in barberries and mahonia - 77

California	13
Colorado	6
Montana	2
Oregon	31
Utah	2
Washington	23

Total Number of barberries and mahonia inspected -1,468,056

Inside Area	697,505
Outside Area*	770,551

Breakdown of Approved Stock

	Inside Area	Outside Area*	Total
Berberis thunbergi	7,555	6,997	14,552
B. thunbergi atro.	10,798	34,135	44,933
B. thunbergi (other	1,414	12,524	13,938
Other barberries	18,013	125,118	143,131
Mahonia	659,725	591,777	1,251,502
Totals	697,505	770,551	1,468,056

Breakdown of Restricted Stock

	Inside Area	Outside Area	Total
1-year seedlings	300		300

* States of Western Region other than Colorado, Montana, Wyoming, and Washington.

PRESENT STATUS, PROGRESS, AND FUTURE REQUIREMENTS, 1918-1958

Barberry Eradication

Fiscal Year 1958

STATE	SQUARE MILES										PROPERTIES			BARBERRY BUSHES DESTROYED		
	Total in State to be Worked	Number Covered				Number Requiring Work One or More Times				Number Requiring No Future Work	Total Found To Date	Number Needing One or More Reinspections	Number Completed	Common	Native	Total
		Initial Work		Rework		Farm-stead		Intensive								
		Farm-stead	Inten-sive	Farm-stead	Inten-sive	Initial	Rework	Initial	Rework							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Colo.	74,685	74,036	5,600	9,148	4,792	0	0	0	136	74,549	3,075	539	2,536	102,121	74,979,531	75,081,652
Mont.	146,316	146,316	417	6,044	706.25	0	0	0	83	146,233	740	190	550	54,719	0	54,719
Wash.	29,872	29,872	2,542	165	1,633	0	20	100	816	28,936	11,336	11,014	322	199,380	0	199,380
Wyo.	94,487	94,487	558	7,367	1,267	0	0	0	10	94,477	142	21	121	5,674	0	5,674
TOTALS	345,360	344,711	9,117	22,724	839.25	0	20	100	1,045	344,195	15,293	11,764	3,529	361,894	74,979,531	75,341,425

GPO 978141

EXPENDITURES BY SOURCE AND BY ACTIVITY

Barberry Eradication

Fiscal Year 1958

Source of Cash & Equivalent*	1 Planning & Direction	2 Technical Assistance	3 Survey	4 Control	5 Regulatory	6 Methods Improvement	7 Other	8 Total
Plant Pest Control Division	$7,208	$3,465	$29,702	$25,802	$1,517	$470		$68,164
Other Organizations (Name)								
1/ States			7,500	6,601				14,101
2/ Counties			387	77				464
Subtotal-Other Organizations			7,887	6,678				14,565
Total (of PPC & Other)	7,208	3,465	37,589	32,480	1,517	470		82,729
Contributed Services**								
1/ States	500	1,250			3,500			5,250
State 3/ College		2,500	250				600	3,350
Individuals				100				100
Total	500	3,750	250	100	3,500		600	8,700
Grand Total	$7,708	$7,215	$37,839	$32,580	$5,017	$470	$600	$91,429

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

1/ Colorado, Montana, Washington, Wyoming.

2/ State of Washington only.

3/ Includes Experiment Stations and Extension Services in eradication states.

COOPERATIVE AID RECEIVED

Barberry Eradication

Fiscal Year 1958

State and Source of Aid	1 Cash and Equivalent Aid* Cash	2 Personal Services	3 Equipment & Supplies	4 Space	5 Total of Cash & Equivalent	6 Intangible Service Estimate**	7 Source Grand Total	8 Remarks
COLORADO								
Div. of Agric. Experiment Sta.	$	$4,307.50	$ 584.35	-	$4,891.85	$1,000.00 1,000.00	$5,891.85 1,000.00	
IDAHO								
University of Idaho Exp. Sta.						250.00	250.00	
MONTANA								
Dept. of Agric. Experiment Sta. & Ext. Ser.	1,708.85				1,708.85	750.00 500.00	2,458.85 500.00	
WASHINGTON								
Dept. of Agric.	7,500.00				7,500.00	2,500.00	10,000.00	
Counties Experiment Sta. & Ext. Ser.	464.00				464.00		464.00	
State College						1,000.00	1,000.00	
Individuals						600.00 100.00	600.00 100.00	
WYOMING								
						1,000.00	1,000.00	
Total This Period	$9,672.85	$4,307.50	$584.35		$14,564.70	$8,700.00	$23,264.70	

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

BURROWING NEMATODE

July 1, 1957 - June 30, 1958

In cooperation with other
Federal, State, County, and Local Agencies

November 15, 1958
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

During the year approximately 1,200 groves and nearly 1,400 nurseries and greenhouses were inspected. The combined acreage represented in these surveys was approximately 22,300. Delimiting surveys were made of 1,535 acres of commercial groves, of which approximately 1,468 were treated by the State Plant Board.

Inspections have been made in all citrus nurseries on record, and new infestations were found in 43; however, only 8½ acres were involved, indicating that the infestations were found principally in small nurseries. Infestations were found in 33 ornamental nurseries, again involving only a limited acreage, as less than 18 acres were involved. In February 1958 the State Plant Board initiated site approval regulations which will still further increase the effectiveness of procedures developed to prevent further spread of the pest in connection with the movement of citrus nursery stock.

The attached map shows the location by township of burrowing nematode infestations in commercial groves, indicating the townships where all commercial grove properties have been treated, as well as those where only a few groves remain to be treated. There is shown, also, on this map the location of these infestations in other than commercial groves, exclusive of home dooryard infestations, and the townships in which treatments have been completed.

B. Major deviation from Work Plan

Injunction proceedings were brought against the Florida State Plant Board in May 1958, which brought to a halt the compulsory push and treat program. As a result of this action, the program was modified to provide for reinspection of margins of areas previously treated and for additional treatment, where necessary, with the continuation of survey and regulatory activities in nurseries to prevent further spread.

C. Status of Program at close of year

Reworking of marginal areas previously treated was continued, along with inspections and treatment of nursery properties. The legal entanglement brought about as a result of the May injunction proceedings had not been worked out at the close of the fiscal year.

II. Program Activity during fiscal year

A. Planning and Direction

1. How planned and directed

The program was planned and directed jointly by personnel of the Florida State Plant Board and the Plant Pest Control Division after reviewing all research data available from State and Federal research agencies. The Industry Spreading Decline Committee also assisted Federal and State agencies in working out a satisfactory program plan.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Citrus growers, nurserymen, and personnel of citrus organizations were acquainted with survey and control methods, as well as treatment procedures that could be used as a basis for the movement of nursery stock from areas found infested.

2. Technical assistance provided to program by cooperating agencies

State and Federal research agencies worked closely with program personnel, keeping them informed of the latest research findings so that modifications in the program might be made as deemed desirable.

C. Survey

1. Procedures or techniques used

In citrus groves cursory visual symptom surveys were made; and if suspicious trees were noted, root samples were taken. If the samples were positive, the grove was then mapped visually, following which root samples were taken. The root sampling was continued until the infested area was surrounded by two rows of trees from which no nematodes were recovered. In citrus and ornamental nurseries, survey techniques consisted entirely of taking root samples and reading them in the laboratory.

2. Accomplishments

During the report year, surveys were made in 1,203 groves and 1,390 nurseries and greenhouses, involving a total of 22,297 acres. Infestations were reported for the first time in 165 additional groves, and delimiting inspections were completed of 341 grove properties, involving 1,535 acres. The accumulative total of acres delimited in citrus groves was 4,024. It is estimated that there are now approximately 8,800 acres of citrus groves known to be infested in the State of Florida.

During the year, 179,596 root samples were processed through the laboratory. Positive samples were involved in 10,277 of these.

D. Eradication or Control

1. Procedures or techniques used

The State Plant Board of Florida applied eradication treatments, which consisted essentially of the removal of the diseased trees and trees along the margin of the infested area, the fumigation of the soil with DD, the prohibition of replanting in the treated area for two years following treatment, and maintenance by the grower of clean cultivation for a minimum of six months after the pushing and treating had been accomplished.

2. Accomplishments

During the report year, treatments were applied in 234 groves involving 1,468 acres. The accumulative citrus acreage treated to date is approximately 4,184. This represents approximately one-half of the total known infested acreage in commercial groves in the state.

E. Regulatory

1. Procedures or techniques used

This phase of the program is under the direction of the State Plant Board. Essentially, the procedure is to prohibit the movement of citrus nursery stock from known infested nurseries unless approved hot water dip treatments have been applied. Ornamental nurseries harboring infestations are not allowed to move their stock into areas of commercial grove plantings. Negative inspections are demanded by several of the citrus-growing states prior to their agreeing to receive stock from nurseries in Florida.

In February of 1958, the State Plant Board invoked regulations requiring that all citrus nursery planting sites be approved by the State Plant Board prior to planting. This nursery site approval, which involved the plant block and sufficient environs area, will considerably expedite the quarantine regulations designed to prevent further spread through the movement of infested citrus stock.

2. Accomplishments

All infested citrus nursery stock was either destroyed by the nurserymen, or they were instructed that it could not be moved until it was hot-water treated. Owners of a number of ornamental nurseries carried on treatments in an attempt to clean up infestations which had been found on their properties.

Satisfactory progress was made in the adoption of the nursery site approval requirements for citrus nurseries. In fact, the

regulations have been well accepted by the majority of the citrus nurserymen and welcomed by citrus grove owners. Inspections to back up the nursery site approval regulations are being made jointly by the State Plant Board and the U. S. Department of Agriculture.

F. Methods Improvement

In cooperation with the Florida State Plant Board, modifications were made in the State-operated tractor fumigation units. Strainers were added to reduce the problem involved in nozzle stoppage, and gauges were installed, making it possible for the operator to determine immediately when stoppage had occurred.

The fumigation units were equipped with new types of packers and sealers. This modification is a considerable improvement as the fields are left practically level after the fumigation treatment, resulting in a better seal over the fumigant. Previously, the fields were left very ridged as only the area behind the colter was packed.

One of the problems involved in nematode survey procedures was that of shipping specimens from scattered locations well removed from the laboratory in Lake Alfred and the screening stations operated at Orlando, Sebring, and Tampa. Procedures which had been used consisted of sending in the roots in pint jars, which meant that, in addition to the problem of packing and shipping the containers, the root samples might be adversely affected by temperatures encountered in shipment, or by uncontrolled incubation periods during shipment. These factors could result in the death of the nematodes which would, of course, affect the determination as to whether the property was or was not infested. Procedures were worked out so that the samples were incubated at the field stations under controlled conditions and the washings submitted in small polyethylene containers which were easy to reclean. Provisions were made so 16 of these containers could be sent in a single insulated cardboard box and a one-pint cold pack could be added to shipments during hot weather. This resulted in considerable savings in time and, of more importance, increased the effectiveness of survey at scattered locations throughout the state.

The use of screens with the jeep-mounted augers in citrus groves was initiated. The effectiveness of the present survey procedures, using augers and screens, was checked against the old system of sampling by hand without a screen. It was found that the new procedure is 23 percent more effective in recovering nematodes. This increase in known effectiveness does not take into account the increased efficiency that could be expected by excluding, to a considerably greater extent, the human error which is involved in the hand sampling techniques previously employed.

Preliminary studies were made to determine the relative effectiveness of washing soil samples in the field as they are dug, rather than

bringing them into the laboratory at the end of the day. Insufficient information is available as yet to make any conclusions.

Work was done on the jeep auger units in order to reduce, to the extent possible, unnecessary breakdowns and to investigate ways and means of taking root samples at a greater depth.

In cooperation with personnel of the Citrus Experiment Station, herbicidal plots were established in citrus groves to determine whether this method of controlling weed growth would be more practical than cultural methods previously employed. Herbicide plots established in the fall of 1957 were adversely affected as a result of the severe winter freezes. Plots established in the spring of 1958 did not yield a material that would provide effective control at a price which could compete with cultural control.

G. Other

1. Cooperation received during fiscal year

State and Federal research agency personnel worked closely with program personnel in reviewing all phases of the work, making suggested criticisms as to ways and means of improving the effectiveness thereof. A number of industrial concerns handling various types of herbicides worked closely with the program by providing materials that they felt might give effective control of weed growth in pushed and treated areas. The Industry Spreading Decline Committee, also, worked very closely with program personnel.

2. Associated activities and services

Efforts devoted to acquainting the public with all phases of the Burrowing Nematode Program included 289 feature and news stories, the distribution of 5,000 circulars, attendances at six public meetings at which talks were given and/or slides were shown, one TV presentation, and various exhibits and special reports.

III. Recommendations for coming year

A. Survey

Should the compulsory push and treat program be reinitiated, as is expected, more effort should be devoted to surveys to detect nematodes in groves where no inspections have been accomplished. The inspection program to date has necessarily been too limited in overall scope to delimit areas previously found infested rapidly enough to keep ahead of the push and treat program.

B. Eradication or control

There is an urgent need for a nematocide treatment which would eliminate the burrowing nematode without making it necessary to destroy affected groves.

C. Regulatory

The effectiveness of regulations devised to prevent the spread of the nematode in movements of nursery stock would be considerably improved if a treatment could be devised which would eliminate the nematodes in nursery stock soil balls without injury to the plants.

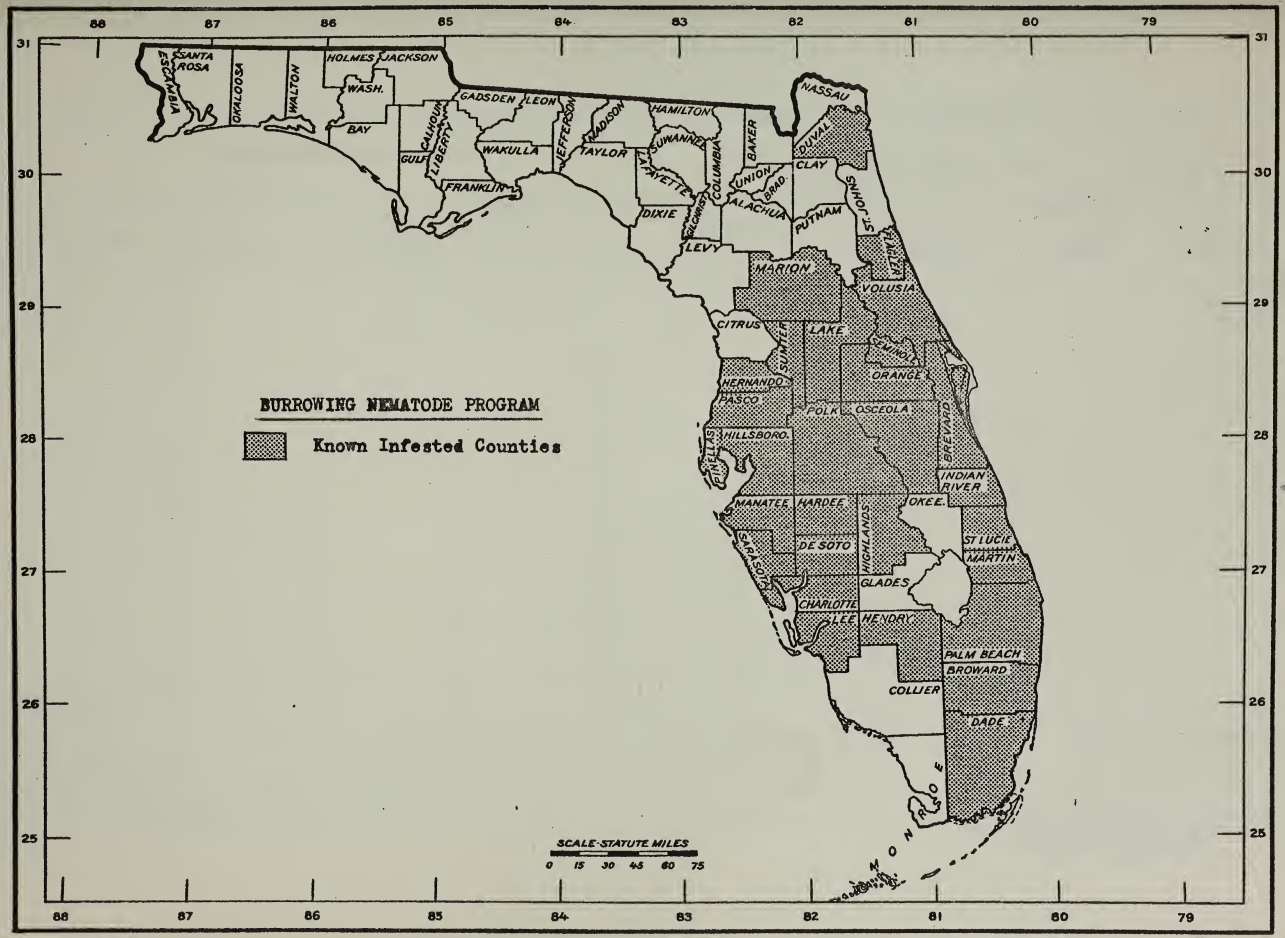
D. Methods Improvement

Additional studies should be conducted with the use of herbicides. The material should be applied immediately after the fumigation has been completed. In the studies conducted to date, unfortunately, the herbicides were applied to areas which had been pushed and treated some time prior to the application of the herbicides. It is entirely possible that the herbicides plus the action of the fumigant may provide the effective weed growth control desired at a cost cheaper than cultural control and, of more importance, provide more effective weed control during periods when weather does not permit cultural operations. Additional field studies should be conducted in an attempt to improve still further the effectiveness of survey procedures.

E. Associated Activities

Additional work is needed to keep the public well informed regarding all phases of the cooperative Burrowing Nematode Program.

FLORIDA


BURROWING NEMATODE PROGRAM
Known Infested Counties
SCALE-STATUTE MILES
0 15 30 45 60 75
ESCAMBIA
SANTA ROSA
OKALOOSA
WALTON
HOLMES
JACKSON
WASH.
BAY
GULF
CALHOUN
LIBERTY
FRANKLIN
GADSDEN
LEON
WAKULLA
JEFFERSON
MADISON
TAYLOR
HAMILTON
SUWANNEE
LAFAYETTE
COLUMBIA
BAKER
NASSAU
DUVAL
CLAY
UNION
BRAD.
ALACHUA
PUTNAM
ST. JOHNS
FLAGLER
DIXIE
GILCHRIST
LEVY
MARION
VOLUSIA
CITRUS
SUMTER
LAKE
SEMINOLE
ORANGE
HERNANDO
PASCO
POLK
OSCEOLA
BREVARD
PINELLAS
HILLSBORO.
INDIAN RIVER
MANATEE
HARDEE
OKEE.
ST LUCIE
MARTIN
SARASOTA
DE SOTO
HIGHLANDS
GLADES
CHARLOTTE
LEE
HENDRY
PALM BEACH
BROWARD
COLLIER
DADE
MONROE

BURROWING NEMATODE

Region: Southern

Prepared by:

Period *(Designate: Month, 1-15, 16-31, or 1-31)*: Fiscal Year 1958

Date Prepared:

STATE AND COUNTY A	SURVEY					CONTROL		
	Detection			Delimitation				
	Groves Inspected B	Nurseries & Greenhouses Inspected C	Acres Inspected D	Properties Inspected E	Acres Inspected F	Nurseries and Greenhouses Treated G	Groves Treated H	Total Acres Treated I
Florida	1,203	1,390	22,297.27	341	1,535.59	39	234	1,468.04
Total This Period								
Total From July 1	1,203	1,390	22,297.27	341	1,535.59	39	234	1,468.04
Total From Beginning of Program Dec., 1953	7,102	6,109	111,961.39	682	4,024.75	65	560	4,184.66

Report: Total counties infested to date:

PPC 7-2
(Feb-58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

BURROWING NEMATODE

Region: Southern

Prepared by:

Period (Designate: Month, 1-15, 16-31, or 1-31): Fiscal Year 1958

Date prepared:

STATE AND COUNTY A	NEW INFESTATIONS		CLASSIFICATION OF INFESTED PROPERTIES							
	All Properties B	Total Acres C	Citrus Groves		Citrus Nurseries		Ornamental Nurseries		All Other	
			Number D	Acres E	Number F	Acres G	Number H	Acres I	Number J	Acres K
Florida	264	371.62	165	325.05	43	8.50	33	17.77	23	20.30
Total This Period										
Total From July 1	264	371.62	165	325.05	43	8.50	33	17.77	23	20.30
Total From Beginning of Program Dec., 1953	2,027	10,832.91	1,354	8,848.25	285	469.32	235	1,279.46	153	235.88

PFC 7-2a
(Feb-58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

SUMMARY OF ASSOCIATED ACTIVITIES

Program Burrowing Nematode

Region Southern - Area IV

Prepared by: F. D. Bittner

Fiscal year 7/1/57-6/30/58

Area	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used**				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.*	Infest. Maps & Posters	
Burrowing Nematode Program	6	2	4	-	-	1	289	7	-	5,000	7	2
Total												

*Written by Federal personnel for release direct or through cooperators.
**This should be a conservative estimate (accurate record for these items impractical).

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
MEXICO REGION FOR COOPERATIVE PROGRAMS

ANNUAL PROGRAM REPORT

MEXICAN FRUIT FLY AND CITRUS BLACKFLY PROGRAM
CITRUS BLACKFLY

July 1, 1957 - June 30, 1958

In cooperation with

MEXICAN NATIONAL BLACKFLY COMMITTEE
and
MEXICAN DEFENSA AGRICOLA

November 10, 1958
Monterrey, N. L., Mexico

W. K. Clore
Regional Supervisor

I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

A. Accomplishment for the Fiscal Year

In the chemical control zones of Mexico, surveys revealed 527 lightly to heavily infested properties in various zones of the states of Tamaulipas, Nuevo Leon and Sonora. The nearest known infestations to the United States-Mexico Border were in Nuevo Leon and these were eradicated to a distance of 130 airline miles south. Light infestations were found and eradicated at Hermosillo, Sonora; Sabinas Hidalgo and Monterrey, Nuevo Leon. The heaviest infestations found were in the vicinities of Linares and Montemorelos, N. L. These were reduced to incipient infestations with only a moderate amount of spraying being necessary by the end of the fiscal year. Light infestations in a number of communities were found and immediately treated in the chemical control zone of Victoria, Tamaulipas.

Chemical control procedures have prevented a build-up of the blackfly population, thus averting a spread to zones north toward the U. S. Border, apparently free of the citrus blackfly.

Suppression of the blackfly with parasites was generally good with a reduction of infestation over the previous year in biological control zones.

B. Major Deviation from Work Plan None

C. Status of Program at Close of Year

At the close of the fiscal year there were only a few incipient infestations in the states of Tamaulipas and Nuevo Leon of the chemical control zones and these were receiving the prescribed insecticide applications. There was no known infestation in the Hermosillo, Sonora zone or the free area to the north. The nearest known infestation to the United States was 130 airline miles south at Allende, N. L.

In the biological control zones the blackfly was generally controlled. Fluctuations with some increase in infestation were present in a few groves and gardens in the State of Tamaulipas at Llera, El Carmen, Mante and on the highway from Mante to Tampico. Near Valles, San Luis Potosi there were a few new infestations near cotton fields that had been dusted with insecticides. The blackfly was well controlled in the State of Colima and parasites are expected to be collected early in 1959 fiscal year. The infestation at Los Mochis, Sinaloa was reduced considerably. There were several infestations in the State of Sonora but most had good parasitization, principally by the *Prospatella opulenta*.

II. PROGRAM ACTIVITY DURING THE FISCAL YEAR

A. Planning and Direction

1. How Planned and Directed

The Regional Supervisor, his assistant and entomologist and area supervisors had frequent conferences with the President of the National Blackfly Committee and his assistants for the purpose of planning the cooperative program. During these conferences and on field trips, areas of responsibility were fixed and agreements reached on how best to carry on the work to attain the desired program objectives. Program activities were directed through district supervisors working in cooperation with supervising personnel of the cooperators.

B. Technical Assistance

1. Technical Assistance Provided to Farmers and Others by Program Personnel

Technical assistance by PPCD personnel is provided on surveys, insecticide applications and biological control.

The Biological Control Specialist of PPCD stationed in Mexico City and working cooperatively with the National Blackfly Committee and Defensa Agricola furnished technical assistance in obtaining, collecting, properly liberating and rearing a number of parasites and predators of insect pests of mutual interest to both countries, some of which are: The predator of the spittle bug; parasite Anagyrus antoninae of the Rhodes grass scale; three parasites of the spotted alfalfa aphid, and the parasite Aphytus lepidosaphes of purple scale.

2. Technical Assistance Provided to Program by Cooperating Agencies

Survey procedures and insecticide applications are based on findings and recommendations of the Fruit Insect Section of the Research Division.

C. Survey

1. Procedures or Techniques Used

a. Field. Surveys are visual and are accomplished with crews of from 8 to 12 scouts. Slow and fast crews are used in some zones. Slow crews, which are more generally used, inspect each individual tree and delimit infestations located by the fast crew in parts of zones where it is deemed unnecessary or impractical to inspect all trees in a grove.

b. Laboratory. Laboratory activities are accomplished by the National Blackfly Committee. Infested leaves are collected and sent to the laboratory for the purpose of evaluating the effects of eradication treatments in the chemical control zones and to determine the degree of parasitization and the necessity of parasite releases in the biological control zones.

II. PROGRAM ACTIVITY DURING THE FISCAL YEAR - continued

C. 2. Accomplishments

Surveys were made in the eradication and free zones of the states of Tamaulipas, Nuevo Leon, Sonora and Baja California. (See Table 1, PPC 7-3) Inspections indicated all zones adjacent to the United States to be free of citrus blackfly with the nearest infestation found south of the U. S. Mexico line a distance of 75 miles. Through surveys in the biological control zone newly infested properties were located, making possible an efficient and economic distribution of parasites. Generally good control was obtained in most all zones.

Both black and mercury vapor light traps were operated in Victoria, Tamps. and Linares, N. L., with negative results for pink bollworm and citrus blackfly.

Mediterranean fruit fly traps were operated during eight months at Linares and Montemorelos, Nuevo Leon and Matamoros and Nuevo Laredo, Tamps., with negative results.

3. Statement or Table of Pest Damage

Control and eradication measures employed maintained infestations at such a low level that only a few were sufficiently intense to cause any appreciable damage.

D. Eradication or Control

1. Procedures or Techniques Used

Incipient infestations found in the Hermosillo, Sonora zone of the Western Area were given one eradication spraying with rotenone and oil. In the Eastern Area in the chemical control zones commercial groves were sprayed with four applications of malathion at 21-day intervals and city properties with three applications of rotenone and oil at 21-day intervals. In some heavily infested groves in the Guaymas-Empalme, Sonora zone one treatment with rotenone and oil was applied to effect a reduction in infestation which was followed by the liberation of parasites. In the Victoria, Tamaulipas zone, heavily infested trees were partially defoliated in groves and gardens where parasitization of blackfly was low, after which parasites were released, generally resulting in good control.

In the biological control zones where parasitization was high, parasite collections were made for liberation in groves with low or no parasitization. Occasionally partial defoliation of heavily infested trees not sufficiently parasitized were made so that the parasite population might increase sufficiently to attain good control of the blackfly.

II. PROGRAM ACTIVITY DURING THE FISCAL YEAR - continued

D. 2. Accomplishments

Infestations were reduced and eradication was accomplished on infested properties in the chemical control zones where insecticides were applied. (See Table 1, PPC 7-3)

Citrus blackfly infestations were generally suppressed and well controlled by the release and proper distribution of parasites. In the Victoria, Tamaulipas zone only, nearly one million parasites were released. They were Prospatella opulenta, Prospatella clypealis and Amitus hesperidum. Many collections and liberations were made in other zones of Mexico.

E. Regulatory

1. Procedures or Techniques Used

Inspection stations operated by the National Blackfly Committee were maintained to prevent the entry of host materials from infested to free zones and from lightly to heavily infested zones. Movement of materials capable of disseminating the citrus blackfly was regulated by Mexican government officials.

Packing sheds from which citrus fruits are moved to or through the United States were inspected periodically and were required to maintain sanitary conditions in accordance with regulations. Trucks and railroad cars loaded with citrus fruit destined for export through the United States were also required to comply with sanitary requisites. PPCD personnel inspected and issued certificates permitting their entry into the United States.

2. Accomplishments

Multiple inspection stations maintained and operated jointly by the PPCD and Defensa Agricola intercepted and destroyed large quantities of citrus blackfly host materials. (See Table 2)

Certificates on trucks and railroad cars were issued for movement of 1,062,491 standard boxes of citrus fruit to Brownsville, Texas, for export.

F. Methods Improvement (Not applicable)

G. Other

1. Cooperation Received during Fiscal Year

a. Major Contributions Received and Importance to Program

The National Citrus Blackfly Committee shares in surveys and is responsible for insecticidal control of infested properties. Biological control activities in the field as well as in laboratories are carried on

II. PROGRAM ACTIVITY DURING THE FISCAL YEAR - concluded

G. 1.- by the Committee with PPCD furnishing technical and directional assistance. Through a chain of road stations host materials of the citrus blackfly are prevented movement from infested to free zones as well as inter-zone movement within infested areas.

On the West Coast of Mexico inspection stations are operated jointly by the PPCD and Defensa Agricola of Mexico with each cooperator sharing in salaries and costs of maintenance and operation. Authority for enforcement of quarantines is vested in the cooperating Mexican Government agencies. Without the contribution of the cooperator, and the fact that all work as a unit, the program objectives could not have been accomplished.

b. Cooperative Work Needing Strengthening Another Year (Not applicable)

2. Associated Activities and Services

a. Program Servicing

(1) Evaluation. At the American-Mexican Work Conference held in October 1957 in Mexicali, B. C., papers were presented on various insect problems of mutual interest by representatives of the Republic of Mexico, the U. S. Federal Government and the states of California, Arizona, New Mexico and Louisiana.

The Biological Control Specialist of PPCD stationed at Mexico City showed a film and slides of various insects of mutual interest at the inauguration of the biological laboratory near Jalapa, Veracruz in April 1958. The viewing was attended by the President of the Republic, the Minister of Agriculture, Director General of Defensa Agricola as well as officials of the National Blackfly Committee and growers.

III. RECOMMENDATIONS FOR COMING YEAR

A. Surveys

Surveys should be continued as in the past. Some study should be given to developing a more economical system of survey.

B. Eradication or Control

It is recommended that the present eradication or control procedures be continued and that biological control in the Victoria, Tamps. zone be strengthened.

C. Regulatory No changes
D. Methods Improvement (Not applicable)
E. Associated Activities No changes

****

TABLE 1

CITRUS BLACKFLY

Region: MEXICO

Prepared by:

Period *(Designate: Month, 1-15, 16-31, or 1-31)* July 1, 1957 to JUNE 30, 1958

Date Prepared

STATE COUNTY LOCATION	INSPECTIONS BY LOCATION		INFESTATIONS BY LOCATION		CONTROL APPLICATIONS							
					Property Sprayed				Trees Sprayed			
	Properties Number B	Trees Number C	Properties Number D	Trees Number E	1st F	2nd G	3rd H	4th I	1st J	2nd K	3rd L	4th M
A												
TAMAULIPAS	10,955	218,265	111	282	230	250	208	36	16,261	16,367	13,393	7,473
NUEVO LEON	14,015	826,861	409	2,938	1,769	1,786	1,812	159	146,217	171,016	164,682	113,455
SONORA	3,154	199,354	7	71	61				17,516			
BAJA CALIFORNIA	1,806	7,269										
F. Y. 1958 Total ~~This Period~~	29,930	1.251,749 1/	527	3,291	2,060	2,036	2,020	195	179,994	187,383	178,075	120,928
Total From July 1												

1/ Error of 40 on November 1957 report, now corrected.

PPC 7-3 (Feb-58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Table 2

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

Region - Mexico

Cooperative Inspection Stations

F. Y. 1958

Inspection Stations	Type of Inspection	Number of Inspections	Number of Passengers & Braceros	Pieces of Baggage & Express	RR cars & trucks cleaned &/or fumigated	Host Interceptions: Occasions MFF	Occasions CBF	Occasions PBW	Items MFF	Items CBF	Items PBW	Items KB
BAJA CALIFORNIA												
Tijuana	Plane	2,848	66,845	236,527	-	1,430	138	-				
Mexicali	Planes	1,221	14,286	51,730								
	Trucks	382		-		273	35	34				
	Railroad	-		14,400	150							
Ensenada	Plane	399	535	1,405		49	10	-				
	Boat	81	533	838		20	14	3/2				
SONORA												
San Luis	Rd.Station	12,124	-	-	-	967	50	217				
Benjamin Hill	RR cars	6,768	-	-	1,365							
	RR pssgr.	-	1/253,954	-		-	-	-	23,227	1,692	4,813	5K.
	Rd.Station	128,873	-	-	316	15,397	874	529				
Nogales	Plane	777	9,353	23,334	-	343	76	31				
	RR Mkt.Mail	Daily	-	-	-	319	66	-				
SINALOA												
Mazatlan	Rd.Station	39,817	81,012	-	1,882						2,510 and 1,075 k. cottonseed	
	Plane	413										
	RR cars	1,126	26,551	0	0							
	RR trains	522										
	Boat	344										
Terreros 2/	Rd.Station	10,723	-	-	327	-	-	-			367	
TOTALS		206,418	453,069	328,234	4,040	18,798	1,263	813	23,227	1,692	8,765	5k.

1/ 131,658 Braceros. 2/ Station operated since 2/21/58. 3/ 1,769 bales of bagging.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
PROGRAM COST DISTRIBUTION

TABLE 3

CITRUS BLACKFLY PROGRAM	MEXICO REGION FOR COOPERATIVE PROGRAMS			Reg. Supervisor		Date 10 NOV 1958	F.Y. 1958
Source of Cash and Equivalent (A)	Planning & Direction (B)	Technical Assistance (C)	Survey (D)	Control (E)	Regulatory (F)	Other (H)	TOTAL (I)
1. PLANT PEST CONTROL ARS							
Headquarters	8,500	5,900		2,000			16,400
Eastern Area	9,000	3,450	54,400		2,000		68,850
Western Area	4,750	1,500	9,200		16,250		31,700
2. SUB-TOTAL	22,250	10,850	63,600	2,000	18,250		116,950
3. OTHER							
Citrus Packers Association					2,600		2,600
National Blackfly Committee							
Central Offices						340,362	340,362
State Blackfly Committees							
Biological Control States						234,167	234,167
Chemical Control States						356,281	356,281
4. SUB-TOTAL					2,600	930,810	933,410
5. T O T A L	22,250	10,850	63,600	2,000	20,850	930,810	1.050,360
6. CONTRIBUTED SERVICES None							
7. T O T A L							
8. G R A N D T O T A L	22,250	10,850	63,600	2,000	20,850	930,810	1.050,360

1. PLANT PEST CONTROL DIVISION units. Areas named.
2. Sub-total for all PPC funds included in (1).
3. OTHER ORGANIZATIONS; measurable cash expenditure.
4. Sub-total for all OTHER ORGANIZATIONS, included in (3).
5. Totals of PPC and OTHER ORGANIZATIONS, (2) plus (4).
6. CONTRIBUTED SERVICES.
7. Total of CONTRIBUTED SERVICES (6) only.
8. GRAND TOTAL (5) and (7).

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

CITRUS BLACKFLY

July 1, 1957 - June 30, 1958

In cooperation with other
Federal, State, County, and Local Agencies

November 15, 1958
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishments for fiscal year

Detection surveys were conducted in four of the major citrus producing counties of Texas for a six-month period during the fiscal year 1958. Extensive inspections were made in Cameron, Dimmit, Hidalgo, and Webb Counties during the months of July, August, March, April, May, and June. Three 6-man crews, each with a working crew leader, were used for this work. Inspectors were taken into northeast Mexico for a short training period, which was, beyond a doubt, most helpful to more effective inspections made in Texas.

B. Major deviation from Work Plan

There were no deviations from Work Plans made at the beginning of the fiscal year.

C. Status of Program at close of year

No infestations were found during the fiscal year 1958. The last infestation discovered in Texas was on August 31, 1956.

Surveys were still in progress at the close of the year, with plans to continue through the first quarter of fiscal year 1959.

II. Program Activity During Fiscal Year

A. Planning and Direction

1. All survey work was planned and directed by supervisory personnel of the Plant Pest Control Division, Agricultural Research Service. Control operations are conducted by the Texas Department of Agriculture. No control operations were needed during the 1958 fiscal year as no infestations were found.

B. Technical Assistance

1. Technical assistance, such as the appearance, life history, and damage this insect causes to citrus trees, was furnished to citrus growers and others interested in the industry.

2. Staff personnel of the Texas Department of Agriculture, especially those stationed in the local area, cooperated throughout the year with surveys made along with their regular nursery inspection and certification work. This assistance was most helpful to the program, as State personnel kept a check on all nursery trees.

C. Survey

1. Procedures or techniques used

a. Only one survey method, visual inspection of foliage, was used. Visual inspections are time-consuming; however, the "speed-up" method, devoting 5 to 7 minutes per tree, was used again this year, which provided more coverage of the area than was accomplished when the leaf-by-leaf method was used.

b. No processing of collections was required under laboratory conditions, other than tentative determinations of specimens collected. All suspicious specimens were submitted to Division headquarters in Washington for official determination.

2. Accomplishments

During fiscal year 1958, inspections were made of 7,905 properties in four south Texas counties without finding a single citrus blackfly infestation. During the period, 180,822 citrus trees were inspected.

3. Statement or table of pest damage

No damage occurred as no infestations were discovered.

D. Eradication or Control

The objective of the program is eradication.

1. Procedures or techniques used

When infestations are found, eradication is accomplished by three applications, at 21-day intervals, of an oil-rotenone spray. Malathion sprays are also equally effective; however, four applications are required.

2. Accomplishments

Due to negative findings, no control measures were needed during fiscal year 1958.

E. Regulatory

There is no regulatory work connected with the program as there are no Federal or State quarantines in effect.

F. Methods Improvements

Although continued thought was given to improved survey techniques, no methods better than visual inspections were

developed. In discussions with Research personnel of Mexico City, the need for a better survey method, such as a trap and lure, was mentioned at every opportunity.

G. Other

1. Cooperation received during fiscal year

a. The Texas State Department of Agriculture, Valley Chamber of Commerce Citrus Advisory Committee, growers, and others interested in the citrus industry gave excellent cooperation during the year. Newspapers and radio stations gave publicity to the survey program. All of these contributions were valuable in informing the public as to the object of the surveys conducted each year.

b. Cooperative work received this fiscal year was as nearly perfect as could be expected on any program. The Texas citrus industry is very much in favor of continued surveys, and all those concerned are willing to cooperate in every way possible in preventing the citrus blackfly from becoming established in the United States. The same cooperation that has been received in the past will be needed in the future to keep this insect from becoming established near the international border in Mexico. The eradication zone, which is a cooperative program, in northern Mexico should be continued.

2. Associated activities and services

Other than a few newspaper articles and radio and TV announcements, there were no associated activities on the program this fiscal year.

III. Recommendations for coming year

A. Survey

With a large area to inspect, an unlimited amount of survey work could be done. The work to be accomplished is, of course, determined by the amount of funds available. It is recommended, however, that as much survey work be done each year as funds will permit, taking into consideration the most susceptible areas and proper timing so as to receive the most benefit from monies spent.

B. Permanent eradication should always be the objective of the citrus blackfly program in the United States.

C. Regulatory

No regulatory procedures needed at the present time.

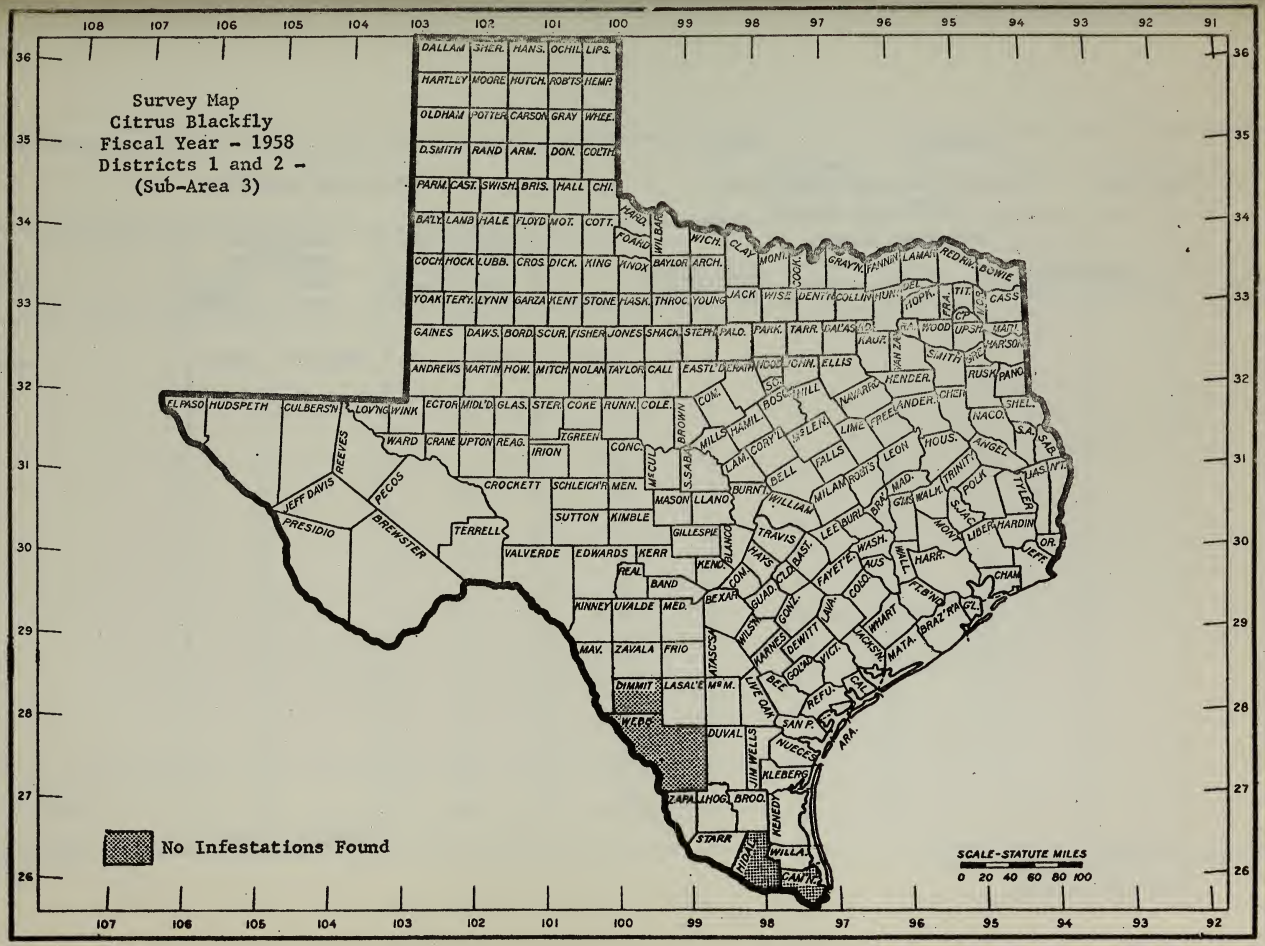
D. Methods Improvement

A more effective and cheaper survey method is badly needed. It is recommended that Methods Improvement Section of Plant Pest Control and Entomology Research make diligent search for a trap and lure to detect the presence of the citrus blackfly in citrus areas.

E. Associated Activities

Any of the associated activities are helpful in conducting a successful program and should be continued to the fullest extent possible.

TEXAS


Survey Map
Citrus Blackfly
Fiscal Year - 1958
Districts 1 and 2 -
(Sub-Area 3)
No Infestations Found
SCALE-STATUTE MILES
0 20 40 60 80 100

CITRUS BLACKFLY

Region	Prepared by
Southern	
Period *(Designate: Month, 1-15, 16-31, or 1-31)* Fiscal Year 1958	Date Prepared

STATE COUNTY LOCATION A	INSPECTIONS BY LOCATION		INFESTATIONS BY LOCATION		CONTROL APPLICATIONS							
					Property Sprayed				Trees Sprayed			
	Properties Number B	Trees Number C	Properties Number D	Trees Number E	1st F	2nd G	3rd H	4th I	1st J	2nd K	3rd L	4th M
Texas	7,905	180,822	0	0	-	-	-	-	-	-	-	-
Total This Period												
Total From July 1	7,905	180,822	0	0.	-	-	-	-	-	-	-	-

PPC 7-3
(Feb-58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Program Citrus Blackfly

SUMMARY OF ASSOCIATED ACTIVITIES

Prepared by: _____

Region Southern

Fiscal year 1958

Area	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used**				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.*	Infest. Maps & Posters	
Texas - Districts 1 & 2 (Sub-Area 3)	-	-	-	-	-	-	-	-	-	-	-	-
Total												

*Written by Federal personnel for release direct or through cooperators.
**This should be a conservative estimate (accurate record for these items impractical).

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

COOPERATIVE ECONOMIC INSECT SURVEY

July 1, 1957 - June 30, 1958

COOPERATING AGENCIES:

State Plant Pest Control Agencies
Extension Service, Experiment Stations
and
Plant Pest Control Division
Agricultural Research Service
U. S. Department of Agriculture

November 1958
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

TABLE OF CONTENTS

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

During the fiscal year, 274 weekly reports on economic insect conditions were submitted with all of the 13 States in this Region participating. In addition, all States submitted summaries of the insect conditions during the summer of 1957. Considerable progress was made in estimating and reporting losses due to insects.

B. Major deviation from Work Plan, if any

None.

C. Status of Program at close of year

At the close of the fiscal year, cooperative agreements were in effect with 5 States. All other States were participating and paying the entire cost of their programs.

II. Program Activity during Fiscal Year

A. Planning and Direction

1. In States where cooperative agreements are in effect, a formal work plan was prepared on a seasonal basis at the beginning of the program. These plans continue from year to year and are reviewed in conferences with the survey entomologists, State clearing house officers and Division personnel. Undertakings are primarily directed by State clearing house officers whether or not an agreement is in effect.

B. Technical Assistance

1. The Division provides, where necessary, identification of insects and maintains a file on occurrence and distribution of various pests. Reports are received weekly from clearing houses and consolidated into a weekly issue on Cooperative Economic Insect conditions which is available to all interested persons.

2. Most of the survey work and compilation of information is performed by cooperating agencies at the State level. This provides current information on local insect conditions and a basis for control and other helpful recommendations to growers. The results of several years of this work was the basis for bulletin No. 321 of the Delaware Agricultural Experiment Station entitled, "Economic Insects and Allied Pests of Delaware". One report from a commercial canner states that they, "had no problem getting pest control information and further that it was supplied in a matter of hours."

C. Survey

1. The procedures used in both field and laboratory are standard as recognized by the Entomological Society of America. They are for the most part outlined in "Survey Methods" prepared by various survey entomologists throughout the nation and published by the Division in 1955. As new techniques are developed, they are reported and this information is made available.

2. There are no data available showing the number of acres surveyed, by pests or crops, since such detailed records are not maintained. There are 5 survey entomologists working full time during the season and in addition there are an estimated 25 to 35 State and Federal men engaged in extension, control and research who devote a substantial portion of their time to systematic observation. In addition there are perhaps 3 or 4 times this number of individuals who make casual observations and report findings to State clearing houses. While the accomplishments in the aggregate are considerable, there remains much room for expanding this work.

3. The many inter-related factors which may cause reduced crop yields make it extremely difficult to assess a dollar value to any one of them. Other damage such as esthetic losses or insects annoying human beings, are difficult to express in terms of dollars. In spite of these and other obstacles, several estimates were made for the 1957 season. The European corn borer destroyed corn valued at over $100,000 in Delaware and nearly three times that amount in Maryland. It was estimated that four insect species destroyed tobacco valued at nearly $1,000,000 in Maryland and that tobacco valued at over 2½ million dollars was saved by the timely expenditure of about $140,000 in control measures. These examples of losses on only two crops in two States indicate the appalling toll taken by all insects on all crops in the 13 States in this Region.

D. Eradication or Control

None.

E. Regulatory

None.

F. Methods Improvement

None except that as indicated above.

G. Other

1. Cooperation received during the reporting year from the States represents the majority of the work performed. It is their program conducted with such coordination as the Division can effect. Virtually all of the survey work, reporting, and summarizing was performed by them, largely at their own expense.

2. In addition to the work outlined, surveys were conducted to determine the abundance of the European corn borer in 10 States in the Fall of 1957.

III. Recommendations for coming year

Increased efforts should be made with particular emphasis being placed on detection surveys and estimating losses caused by insects.

TABLE #1

COSTS COOPERATIVE ECONOMIC INSECT SURVEY - 7/1/57 - 6/30/58

STATE	STATE COST			FEDERAL COST			TOTAL COST
	DIRECT	INDIRECT	TOTAL	REIMBURSED TO STATES	PRORATED	TOTAL	
Maryland	$ 4,520.53	$ 5,000.00	$ 9,520.53	$ 3,750.00	$ 650.00	$ 4,400.00	$13,920.53
Rhode Island	1,551.07	4,000.00	5,551.07	1,500.00	878.00	2,378.00	7,929.07
Virginia	7,822.12	18,900.00	26,722.12	4,000.00	2,200.00	6,200.00	32,922.12
West Virginia	2,365.65	3,000.00	5,365.65	1,200.00	600.00	1,800.00	7,165.65
Delaware	9,655.00	-	9,655.00	2,925.00	775.00	3,700.00	13,355.00
Maine	-	125.00	125.00	-	1,000.00	1,000.00	1,125.00
New Hampshire	-	500.00	500.00	-	1,000.00	1,000.00	1,500.00
Vermont	-	600.00	600.00	-	1,000.00	1,000.00	1,600.00
Massachusetts	-	2,000.00	2,000.00	-	1,000.00	1,000.00	3,000.00
Connecticut	-	1,500.00	1,500.00	-	1,000.00	1,000.00	2,500.00
New York	-	5,000.00	5,000.00	-	1,100.00	1,100.00	6,100.00
Pennsylvania	-	5,000.00	5,000.00	-	1,100.00	1,100.00	6,100.00
New Jersey	-	3,000.00	3,000.00	-	1,100.00	1,100.00	4,100.00
	$25,914.37	$48,625.00	$74,539.37	$13,375.00	$13,403.00	$26,778.00	$101,317.37

The total State cost as reported to Washington on a fiscal report of August 8, 1958 was $43,269. The difference was due to some State reports being received after that date. States showing Indirect costs only are estimates by H. Yost.

TABLE #2

STATE	CLEARING HOUSE	SURVEY ENTOMOLOGIST
Connecticut	Mr. J. Peter Johnson Assistant Entomologist Conn. Ag. Exp. Sta.	
Delaware	Dr. Dale F. Bray, Head Dept. of Entom. Univ. of Del. Newark, Del.	Dr. Paul Burbutis Asst. Prof. Entom. Univ. of Del. Newark, Del.
Maine	Dr. G. W. Simpson, Head Dept. of Entom. Univ. of Maine Orono, Me.	
Maryland	Mr. T. L. Bissell Ext. Entom. Univ. of Md. College Park, Md.	Mr. Wallace C. Harding, Jr. Ext. Instr. Entom. Univ. of Md. College Park, Md.
Massachusetts	Dr. E. H. Wheeler Prof. of Entom. Univ. of Mass. Amherst, Mass.	
New Hampshire	Dr. J. G. Conklin Prof. of Econ. Entom. Univ. of N. H. Durham, N. H.	
New Jersey	Dr. B. B. Pepper Prof. of Entom. Rutgers Univ. New Brunswick, N. J.	
New York	Dr. A. A. Muka Entom. Dept. Cornell Univ. Ithaca, N. Y.	
Pennsylvania	Mr. J. O. Pepper Prof. Ext. Entom. Pa. State Univ. State College, Pa.	
Rhode Island	Dr. F. L. Howard, Head Dept. Plant Path. & Entom. Univ. of R. I. Kingston, R. I.	Dr. Harry L. Hansen Res. Prof., Plant Path. & Entom. Univ. of R. I. Kingston, R. I.

TABLE #2 (Continued)

STATE	CLEARING HOUSE	SURVEY ENTOMOLOGIST
Vermont	Mr. John Scott, Director Div. Plant Pest Control State Dept. of Ag. Montpelier, Vt.	
Virginia	Dr. J. O. Rowell Ext. Entomologist Virginia Polytechnic Inst. Blacksburg, Va.	Mr. Arthur P. Morris Assoc. Ext. Entomologist Virginia Polytechnic Inst. Blacksburg, Va.
West Virginia	Dr. C. K. Dorsey Prof. of Entom. W. Va. Univ. Morgantown, W. Va.	Mr. W. H. Gillespie Survey Entomologist State Dept. of Ag. Charleston 5, W. Va.

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COOPERATIVE ECONOMIC INSECT SURVEY

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PROGRAM ANNUAL REPORT
1958 FISCAL YEAR

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

Cooperative Economic Insect Survey

July 1, 1957 - June 30, 1958

Cooperating Agencies:

State Departments of Agriculture
State Agricultural Extension Services and
State Agricultural Experiment Stations
Individuals and Industries in
the Eleven (11) Western States

October 30, 1958
Oakland, California

Jim R. Dutton
Regional Supervisor

TABLE OF CONTENTS

HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishment for the Fiscal Year

There were two new cooperative agreements negotiated during the 1958 fiscal year. The New Mexico agreement became effective October 1957, with Dallas Rierson, Director, State Department of Agriculture, Las Cruces, New Mexico assuming responsibility for Clearing House operation in addition to being principal cooperator. Wyoming's agreement became effective in June 1958, with the Wyoming Agricultural Extension Service as principal cooperator. Responsibility for operation of the Wyoming State Clearing House was changed from E. W. Spackman, State Entomologist, Cheyenne, Wyoming to T. R. Robb, Extension Entomologist, Laramie, Wyoming.

Major Deviation from Work Plan, if any

None

Status of Program at Close of Year

The Washington State agreement was cancelled in May due to inadequate cooperative financing.

The Arizona agreement, rewritten, approved, and ready for signatures of the cooperators, was not activated due to lack of funds and inability to locate an acceptable Survey Entomologist.

The Utah agreement was cancelled at the close of the previous fiscal year and has not been rewritten. There is still a great deal of interest evidenced by the agricultural agencies in the State of Utah, despite the lack of a cooperative agreement.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

How planned and directed

The Survey Entomologist remains administratively responsible to the prime cooperator in his respective state. His activities are based on a work plan developed and mutually agreed upon by the cooperators and the Division. He works closely with the State Survey Advisory Committee, comprised of a representative from the Extension Service, Experiment Station, State Department of Agriculture, and the Plant Pest Control Division.

Technical Assistance

Technical assistance in providing timely notes on occurrence, abundance and location of economic insect pests was rendered by qualified individuals at Experiment Stations and Extension Services, by State and Federal personnel, and by private and commercial entomologists. An integral part of the reporting service is the proper identification of insects and screening of information received to assure its accuracy. In most cases, this becomes the responsibility of the Entomology Department of the State Colleges.

Survey

Procedures or techniques used

Field

Recommended survey techniques and evaluation were followed insofar as was possible.

Laboratory

Not applicable.

Accomplishments

Beet leafhopper - Early spring surveys were conducted cooperatively with Entomology Research Division personnel. One survey was conducted in Colorado and New Mexico. A series of three surveys were conducted at monthly intervals, beginning in February, in the States of Arizona, California, Nevada, and Utah.

In addition to the above surveys, a beet leafhopper survey was conducted in the desert area in southern California in cooperation with the California State and County Departments of Agriculture.

A similar beet leafhopper survey was conducted cooperatively with the several state agricultural agencies along the Columbia River in Washington and Oregon.

Another series of surveys for beet leafhoppers was conducted by Entomology Research Division personnel in Idaho and participated in by Plant Pest Control personnel assigned to the state. This survey was to determine the extent and abundance of host plants in range areas, the abundance of overwintering populations, and later spring survival and buildup as a basis for control recommendations.

Potato Psyllid - Surveys were made during the month of March in the spring breeding areas of New Mexico, Arizona, and California. A series of five surveys followed on a bi-weekly schedule beginning in May in the summer breeding areas of Utah, Wyoming, and Colorado.

Halogeton - The halogeton problem in the States of California, Colorado, Idaho, Nevada, New Mexico, and Utah required limited surveys and participation by Division personnel. Several special halogeton reports were requested during the year requiring limited surveys and participation in meetings, especially in Nevada and California.

Eradication or Control

Procedures or techniques used

Beet Leafhopper - Idaho: Control of beet leafhopper by chemical means is accomplished by the use of spray composed of one pound of DDT in two gallons of diesel oil applied to host plant areas at the rate of two gallons per acre by either aircraft or ground equipment.

Accomplishments

A total of 3,330 acres was sprayed by aircraft in Idaho during the months of May and June 1958 for the control of beet leafhopper. Some host plant eradication was accomplished by individual ranchers in the cultivated areas, but no estimated acreage of control accomplished by them is available.

Regulatory

Not applicable.

Methods Improvement

Work performed

Federal (BLM) activity was instigated this season to reseed beet leafhopper host plant acreage, and thereby eliminate breeding areas. Ranchers and farmers were encouraged to participate in a similar "cleanup" program on their own properties.

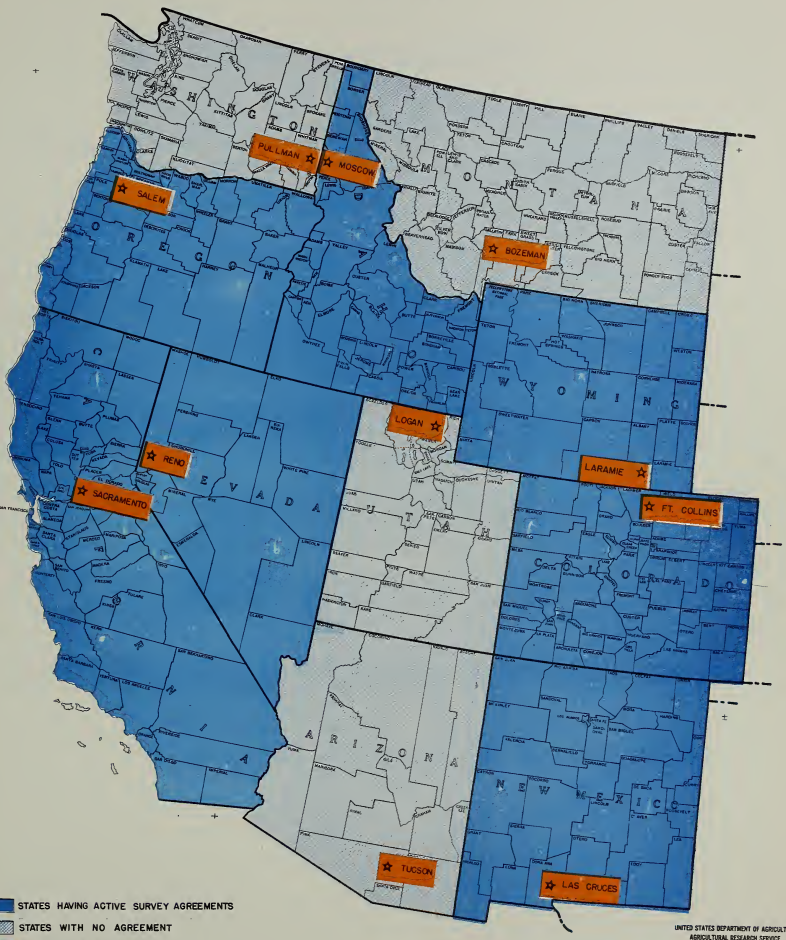
RECOMMENDATIONS FOR THE COMING YEAR

Survey

We recommend that work plans for each state having cooperative agreements be reviewed and rewritten.

COOPERATIVE ECONOMIC INSECT SURVEY

AS OF JUNE 30, 1958



STATES HAVING ACTIVE SURVEY AGREEMENTS

STATES WITH NO AGREEMENT

STATE CLEARING HOUSES

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

GPO 977337

Survey Entomologists

California	Mr. Ronald Hawthorne State Department of Agriculture	Sacramento
Colorado	Mr. Leonard Jenkins Colorado State University	Ft. Collins
Idaho	Mr. Arthur Gittins University of Idaho	Moscow
Nevada	Mr. Robert C. Bechtel State Department of Agriculture	Reno
New Mexico	Dr. Gerald Nielsen State Department of Agriculture	Las Cruces
Oregon	Mr. Joe Capizzi State Department of Agriculture	Salem
Wyoming	Mr. Arlen D. Davison University of Wyoming	Laramie

State Clearing Offices
For Economic Insect Survey Reports

Arizona	Dr. L. A. Carruth, Head, Department of Entomology College of Agriculture, University of Arizona, Tucson
California	Mr. Robert W. Harper, Chief, Bureau of Entomology State Department of Agriculture, Sacramento
Colorado	Dr. Leslie B. Daniels, Head, Department of Entomology Colorado State University, Ft. Collins
Idaho	Dr. H. C. Manis, Head, Department of Entomology University of Idaho, Moscow
Montana	Mr. G. R. Roemhild, Asst. State Entomologist Department of Zoology and Entomology Montana State College, Bozeman
Nevada	Mr. Lee Burge, Director, Division of Plant Industry State Department of Agriculture, Reno
New Mexico	Mr. Dallas Rierson, Director, State Department of Agriculture New Mexico College of A & M Arts, State College
Oregon	Mr. Frank McKennon, Chief, Division of Plant Industry State Department of Agriculture, Salem
Utah	Dr. George F. Knowlton, Extension Entomologist Utah State University, Logan
Washington	Dr. Horace S. Telford, Chairman, Department of Entomology Washington State College, Pullman
Wyoming	Mr. Ted R. Robb, Extension Entomologist University of Wyoming, Laramie

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

EUROPEAN CHAFER

July 1, 1957 - June 30, 1958

COOPERATING AGENCIES:

State Plant Pest Control Agencies
Experiment Stations, Extension Service
and
Plant Pest Control Division - Entomology Research Division
of the
Agricultural Research Service
U. S. Department of Agriculture

November 1958
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

TABLE OF CONTENTS

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

Most of the operations on this program are concentrated in up-State sections of New York, with limited activities in Connecticut and West Virginia where isolated infestations were previously reported.

It is interesting to note that trapping and scouting results in West Virginia were negative again this year. The small area involved and environs near Capon Bridge, Hampshire County, have been scouted with negative results since the application of soil treatments in 1954.

In New York, extensions of previous infestations were found at Syracuse and Buffalo, the latter being an isolated infestation. A new isolated spot infestation was found at Lockport, Niagara County. No chafers were found at previously reported infested spots in Elmira, Minetto and Niagara Falls.

The New York Department of Agriculture and Markets, with the aid of affected communities and Division personnel applied control treatments on all known isolated spot infestations and at critical points within regulated areas. Acres treated totalled 719.

During this reporting period, nursery plants and other regulated materials valued at over 24 million dollars were certified for movement in compliance with quarantine requirements. Affected plant growers continued an aggressive certification soil treatment program.

B. Major Deviation from Work Plan

There was no major deviation from work plan.

C. Status of program at close of year

There was no material change in program status. Some extension of infestation was found in the peripheral territory around the areas of general infestation centered at Newark and Syracuse, New York. These extensions did not involve additional plant growing establishments and for the most part were inside the limits of territory which was placed under quarantine in 1955 and 1957. The gradual enlargement of infested area occurs as a result of natural spread of the chafer during the season of beetle flight in late June and early July.

II. Program Activity during Fiscal Year

A. Planning and Direction

Program activities were planned and directed jointly by State pest control officials concerned and Division Station Supervisors. In

New York State, an industry appointed official participates in discussions on quarantine activities. Research assistance is provided by the New York State Experiment Station, Geneva, and the Entomology Research Division, A.R.S.

B. Technical Assistance

1. Program personnel assisted and supervised regulated industry in the application of approved treating methods for quarantine compliance and gave supervision and technical advice to community representatives participating in local control treatments.

2. Technical assistance was received from the New York State Experiment Station in connection with formulation of treatments for both control and regulatory activities and from the Entomology Research Division in the further exploration of traps and lures for improving detection techniques.

C. Survey

1. Procedures

(a) Visual scouting was started after beetle emergence had been observed for a few days within generally infested territory. Each participating Federal and State inspector was assigned a section to cover on roads surrounding the known area of infestation. In each section inspections progressed outward as far as chafer beetles could be found. Similar scouting activities were conducted completely around smaller areas of infestation.

(b) Traps were used sparingly as practical traps for general usage are not available. Traps placed in Connecticut and West Virginia augmented visual observations on and near known infestations. In Onondaga County, New York, 10 traps were utilized as a check on visual scouting. Improved efficiency of traps and lures is being sought in test undertakings by the Entomology Research Division, A.R.S.

2. Accomplishments

In addition to scouting territory around the peripheral limits of known chafer occurrence of general infestation, scouting observations were also made at isolated areas of previous infestation at Buffalo, Elmira, Minetto and Niagara Falls, New York; at Meriden, Connecticut; and in Hampshire County, West Virginia. Observations were also made at sites in eastern New York, Connecticut, New Jersey, Delaware and Maryland known to have received nursery stock from the Newark, New York area before quarantine on such movement was imposed.

As a result of scouting in New York, infestation was found beyond the limits of the area previously treated in Buffalo and a new site of infestation was found at Lockport, Niagara County. Scouting conducted around the two principal areas of infestation revealed that spread had occurred southward into one rural township in Seneca County lying outside the Newark regulated area and also into three Onondaga County townships outside the Syracuse regulated area. In Connecticut, no extensive advancement of infestation was recorded.

During the current year there was little damage reported from commercial and farm sources, but considerable damage to lawns was reported in some parts of the city of Syracuse, New York. Nurseries within regulated areas are, for the most part, 100% treated with approved residual insecticide to meet requirements for certification and many farmers within the generally infested area apply control treatments in hay and grain crops. Consequently, these activities tend to reduce the amount of commercial damage and that which occurs is evident mostly in abandoned farm fields and in untreated lawns. Golf courses which were severely damaged in earlier years are now protected by control treatments.

D. Eradication or Control

1. There has been no Division program for control or eradication. However, Division personnel participate with State Cooperators and communities involved in application of control treatments at isolated infestations. In these operations granular dieldrin is spread on the soil surface, usually at the rate of three pounds actual dieldrin per acre. On land that is traversable by motorized equipment, a mechanical distributor that is mounted on a Division-owned jeep is used in making the application. On other land the application is by manually operated seed casters.

2. In the fall of 1957 treatments were applied to four areas in New York and in the spring of 1958 three additional areas were treated. Fall treatments included all known spots of isolated infestation and were located as follows: Manlius, Onondaga County; Lockport, Niagara County; Buffalo, Erie County and at the New York State Experiment Station in Geneva, Ontario County. Spring treatments included an additional area at the Experiment Station, an isolated find south of the city of Canandaigua and all of the turf area at New York State Fairgrounds in Syracuse. The treated areas in Canandaigua, Geneva and Syracuse are all located in quarantined territory, but outside of previously known infestation limits. Infestation in these three localities was determined through the finding of European chafer grubs in turf. The treatments at Geneva and Syracuse were made with a dosage of five pounds actual dieldrin per acre while other applications during the year were at a three pounds per acre rate.

Control treatments were applied to a total of 719 acres in New York State during the year. The State of Connecticut applied granular dieldrin on approximately 8 acres of lawns and grasslands at the Meriden infestation in September 1957.

E. Regulatory

1. Within regulated areas plant material, soil, sand and gravel is certified before movement from one location to another. Most establishments now apply regulatory control treatments to growing beds or mining sites before planting and digging operations are started. Although there is a choice of treating materials, practically all operators use granulated dieldrin for soil surface residual treatments. A dosage of five pounds actual dieldrin per acre is required for certification. Unless soil is disturbed to a greater extent than occurs through shallow cultivation, this treatment is effective and provides continuous certification status for at least four years. Supplemental treatments are made either to extend the longevity period of plots or to permit recertification to areas disturbed by digging, erosion, etc.

   There is also a pour-on or dip treatment that is used for quick certification of plants or sod not previously treated with a residual material. A very large volume of plant material is shipped into the regulated area for reshipment to some of the larger establishments. Not being exposed to infestation, such material does not require inspection or treatment but does require certification.

2. During the fiscal year more than 51 million plants and 450,000 tons of soil, sand and gravel having a total estimated value of at least 24 million dollars were certified for movement under European chafer quarantine regulations.

F. Methods Improvement

1. Work on development of an effective survey trap and chafer lure is done by the Entomology Research Division through Dr. Tashiro, stationed at the Geneva Experiment Station. Program personnel assist the research connected with this work by collecting grubs from heavily infested turf areas in the fall for use on experiments during winter months.

2. A trap containing a black, fluorescent light was used late in the year and showed superiority over all other devices previously used for attracting chafer beetles. The improvement was so marked that further development of the device for survey work should be accelerated.

G. Other

1. Cooperation received during fiscal year

(a) The provision of treating materials for control of isolated infestation is a major contribution by the Division of Plant Industry, New York State Department of Agriculture and Markets, in preventing further establishment of general infestation at points outside the present area under regulation. Also the work by Division of Entomology Research is of vital importance to future survey and control operations, although not presently productive of tools for operational use.

III. Recommendations for Coming Year

A. Survey

Continue with scouting as in past, unless an improved trapping device is made available.

B. Eradication or Control

It is recommended that consideration be given to treatments around the periphery of general infestations to effect a progressive reduction of infested area and eventual eradication of the chafer. Certain isolated infestations including the one in Connecticut warrant prompt and continuing eradication attention.

C. Regulatory

No change in regulatory procedures is recommended. No extension of the regulated area is currently recommended.

D. Methods Improvement

Strong support in the development of an effective trapping device for detecting occurrence of adult chafers is recommended.

E. Associated Activities

A picture sheet with life history, control and related information should be made available for general distribution. This would assist detection efforts and be most helpful in public relations.

EUROPEAN CHAFER

Summary of Field Activities

TABLE #1

Fiscal Year 1958

Eastern Region

STATE A	SURVEY				CONTROL TREATMENTS		CERTIFICATION SERVICES		
	Traps in Use B	Locations Scouted C	Acres of New Infestation: Regulated Area D	Acres of New Infestation: Non-Regulated Area E	Soil (Acres) F	Foliage (Acres) G	Shippers Serviced H	Total Service Calls I	Est. Value Products Certified J
Connecticut	39 x	2	-	-	8	-	-	-	-
Delaware	-	-	-	-	-	-	-	-	-
Maine	-	16	-	-	-	-	-	-	-
Maryland	-	10	-	-	-	-	-	-	-
Massachusetts	-	-	-	-	-	-	-	-	-
New Hampshire	-	8	-	-	-	-	-	-	-
New Jersey	-	-	-	-	-	-	-	-	-
New York	10 x	111	80000	21000	719	-	358	1953	24,101,097
Pennsylvania	-	-	-	-	-	-	-	-	-
Rhode Island	-	-	-	-	-	-	-	-	-
Vermont	-	1	-	-	-	-	-	-	-
Virginia	-	25	-	-	-	-	-	-	-
West Virginia	-	38	-	-	-	-	-	-	-
Dist. of Columbia		-	-	-	-	-	-	-	-
Total	49 x	211	80000	21000	727	-	358	1953	24,101,097
Total from beginning of program	xxx	xxx	640024	21000	2898	-	xxx	4879	78,995,370

x New Plastic Type Traps

PPC Form 7-4

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

GOLDEN NEMATODE CONTROL

July 1, 1957 - June 30, 1958

COOPERATING AGENCIES:

New York State Department of Agriculture and Markets
Delaware, Maryland, New Jersey and Virginia Departments of Agriculture
Dept. of Plant Pathology, N. Y. State College of Agriculture, Cornell University
Nematology Section, Crops Research Division
and
Plant Pest Control Division
of
Agricultural Research Service, U. S. Department of Agriculture

November 1958
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

TABLE OF CONTENTS

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

The annual field survey program on Long Island encompassed an area of nearly 39,000 acres of potato land. Minimum sampling of each acre surveyed consisted of portions of soil collected at 8 pace intervals throughout individual fields. A total of 58,943 samples so collected was processed and examined microscopically for presence of golden nematode cysts. As a result, six new infestations aggregating 504 acres were discovered, all within the area of general infestation. (Map #1 - Table #1)

In Virginia, Maryland, Delaware and New Jersey, 6,339 soil samples representative of 33,216 acres were collected at 607 grader stations and a few selected fields. (Table #4) Results were negative.

Considerable progress was made in training Division employees. Employees in several states in this and other Regions are now sufficiently trained to conduct future surveys with only occasional assistance from the Hicksville Laboratory.

B. Major deviation from Work Plan, if any

Survey plans for five mid-western states were necessarily cancelled due to the urgency of activities on other programs and personnel limitations.

C. Status of Program at Close of Year

At present, known infestations in the United States are confined to Nassau and Suffolk Counties, Long Island, New York. The confirmed infested acreage on Long Island as of June 30, 1958 was 13,651 acres. (Table #2) As of that date, 7,733 of those acres had been removed from agricultural use by real estate development leaving the balance of 5,918 acres under regulation as set forth in New York State Quarantine #10. (Table #3)

II. Program Activity During Fiscal Year

A. Planning and Direction

Program activities in each state were planned jointly by Division Station Supervisors and officials of the cooperating State agencies. Regulatory and control operations in New York were planned and directed by the Division Station Supervisor, his Assistant in Charge of Long Island and the New York State Department of Agriculture and Markets Field Supervisor. Survey and laboratory operations were planned and directed by the Division Regional Staff Assistant in charge of the Hicksville Laboratory.

B. Technical Assistance

Technical assistance was provided to cooperators, regulated growers, shippers, carriers and the public in connection with regulatory, control and survey phases of the work. A substantial amount of training in technical procedures was provided this year to Division personnel in this and other Regions so that future surveys might be conducted independently on a regional-state basis. Plant Pathologists from several states, on special assignment to the laboratory, received training in procedures and techniques employed in cyst-forming nematode survey and laboratory operations.

Cooperating research units of the New York State College of Agriculture, Cornell University, and the Nematology Section of the Crops Research Division, A.R.S. provided research data and related technical assistance to the program.

C. Survey

1. Surveys were conducted in accordance with procedures and techniques described in the 1954 edition of the Golden Nematode Handbook.

2. The annual fall survey on Long Island, New York was started on September 15 and completed November 20, 1957. 25,419 soil samples were collected from 14,822 acres of potato land in Nassau and western Suffolk Counties and operationally-exposed potato fields in eastern Suffolk County. Laboratory processing of samples collected revealed initial infestation on two properties in Nassau County and four properties in Western Suffolk County, totalling 504 acres. (Tables #1 and #2)

   The annual spring survey on Long Island was started on March 31 and ended June 26, 1958. 31,960 soil samples were collected from 23,473 acres of potato land in eastern Suffolk County. (Map #1) Extremely wet weather during April and May precluded completion of work on the entire North Fork as planned. Laboratory processing of these samples was incomplete as of June 30, 1958.

   In addition to the regularly scheduled surveys, confirmatory surveys were necessary to verify infestations on six new properties. Samples were also collected from a known infested field selected for soil fumigation experiments for the purpose of determining cyst viability percentages. A similar survey was conducted on an experimental field maintained at Hicksville by Cornell University.

   Surveys were conducted in Delaware, Maryland, New Jersey and Virginia. The grader sampling method was primarily employed in these areas. Samples collected in New Jersey were processed at the Hicksville Laboratory, and those collected on the Delmarva

Peninsula were processed at a temporary laboratory at Dover, Delaware. Survey results in these states were negative.

3. Golden nematode populations on Long Island during recent years have been held below crop damage levels by means of intensive periodic surveys, coupled with the withholding of infested lands from host crop production. In other countries, uncontrolled infestations have been known to inflict total crop failure.

D. Eradication or Control

1. The basic method of control is cultural and consists of withholding infested land from host crop production. Rotation with non-host crops (one potato crop in three years) is another cultural practice which, although not extensively used on Long Island, will prevent a serious build-up of nematode populations. Use of nematocides as soil fumigation treatments is an effective but costly control measure. An effective and practical eradication treatment has not been developed.

2. To hold cyst populations to the lowest possible level, 481.82 acres of known infested land were withheld from host crop production. For withholding this acreage from potato production, farmers were compensated by the New York Department of Agriculture and Markets at the rate of $60.00 per acre. Payments for this purpose totalled $28,909.20.

E. Regulatory

1. New York State Quarantine No. 10 quarantines the counties of Nassau and Suffolk on Long Island, and sets forth regulations governing the growing, marketing and movement of regulated articles.

Regulated topsoil, sod and grader debris is moved under permit to approved final destinations within the regulated area and New York City for landscaping purposes or disposal. Movement of these products to nurseries, greenhouses and agricultural land is prohibited. Movement of potatoes grown on infested fields is restricted to approved outlets in New York City, Yonkers, Mt. Vernon, and within the regulated area on Long Island for consumption therein. These must be packaged in paper containers and moved under permit. Potatoes grown on approved parts of infested fields may be moved without permit provided they are segregated from other potatoes, their identity is maintained, and they are packaged in paper bags or other approved containers. All root crops grown on regulated land must be washed free of soil and moved under permit. Farm machinery, equipment, and other items

used on exposed or infested land require steam cleaning or methyl-bromide fumigation before movement to other farms on Long Island or to other states. Such disinfecting services are provided by the New York State Department of Agriculture and Markets without cost to the farmer, contractor or shipper.

2. Potato movement and grader dirt disposal was supervised at 88 commercial grading stations operating under agreement. A total of 14,781 loads of regulated topsoil was moved under permit from 36 regulated locations. Thirty-five permits were issued under signed agreements to cover the movement of root crops grown on regulated land. Approximately 326 pieces of contaminated farm machinery, vehicles, bulldozers, miscellaneous hand tools and 90 pieces of irrigation pipe were steam-cleaned.

F. Methods Improvement

1. There were no significant changes in program procedures during the year. Minor efforts to improve present field fumigation methods and equipment were continued.

G. Other

1. Cooperation received during fiscal year

The New York State Department of Agriculture and Markets participated in the suppression and prevention of spread phases of the cooperative program by providing manpower, equipment and materials. The New York State College of Agriculture, Cornell University, continued to maintain a special laboratory at Hicksville where research activities were conducted. Nematologists of the Crops Research Division stationed at this laboratory also participated in research. Growers, shippers and transporters likewise cooperated on various phases of the program.

In Delaware, Maryland, Virginia and New Jersey, cooperating state agencies participated in planning surveys and provided temporary laboratory space and manpower to assist with survey operations.

2. Associated activities and services

Golden nematode displays were prepared for two major exhibits this year. One exhibit was presented at the annual open house sponsored by the New York State Agricultural and Technical Institute at Farmingdale. A second display was prepared for the Mid-Island Science Fair at Westbury, New York sponsored by nine participating high schools and supported by various industrial concerns, laboratories, and hospitals. The Science Fair was unique in that selected science students from the different high schools

were assigned to help man the exhibits. The student-teacher group assigned to the golden nematode exhibit made several visits to the Hicksville laboratory in order to become acquainted with the procedure and techniques and to become familiar with program objectives.

Substantial use was made of the golden nematode motion picture, circulars, leaflets and the Handbook of Procedures in presenting information to farmers, nurserymen, state officials, students and the general public. A summary of associated activities is recorded in Table #5.

III. Recommendations for Coming Year

A. Survey

Long Island - Field soil survey should be continued on an annual basis in Nassau and western Suffolk Counties and on the operationally-exposed fields in eastern Suffolk County. The 1959 spring survey should include the South Fork of Long Island and sections of the North Fork not completed during the 1958 spring survey. (Refer to Map #1)

Outside Long Island - In certain areas of the Delmarva peninsula, particularly in Delaware, annual field inspections should be inaugurated since two-thirds of the commercial potato crop is produced by former Long Island growers, many of whom operated infested land on Long Island. Periodic surveys should be continued in other States in the Eastern Region.

B. Eradication or Control

Experimental field fumigation should be continued and expanded in an aggressive manner. Special emphasis should be given to types of applicators, methods of application, a satisfactory seal of treated areas and suitable fumigants.

Plans for research and methods improvement work should be developed each year in advance with participating agencies concurring in the programs to be undertaken. In consideration of surveys accomplished on a national basis since 1944 and the lack of widespread infestation, it is concluded that a closely coordinated research and methods development effort with eradication techniques as the objective is of primary importance. It is recommended that those phases of work underway be reviewed for the purpose of increasing cooperative endeavors pointed toward chemical or other feasible eradicative measures at the earliest practicable date.

C. Regulatory

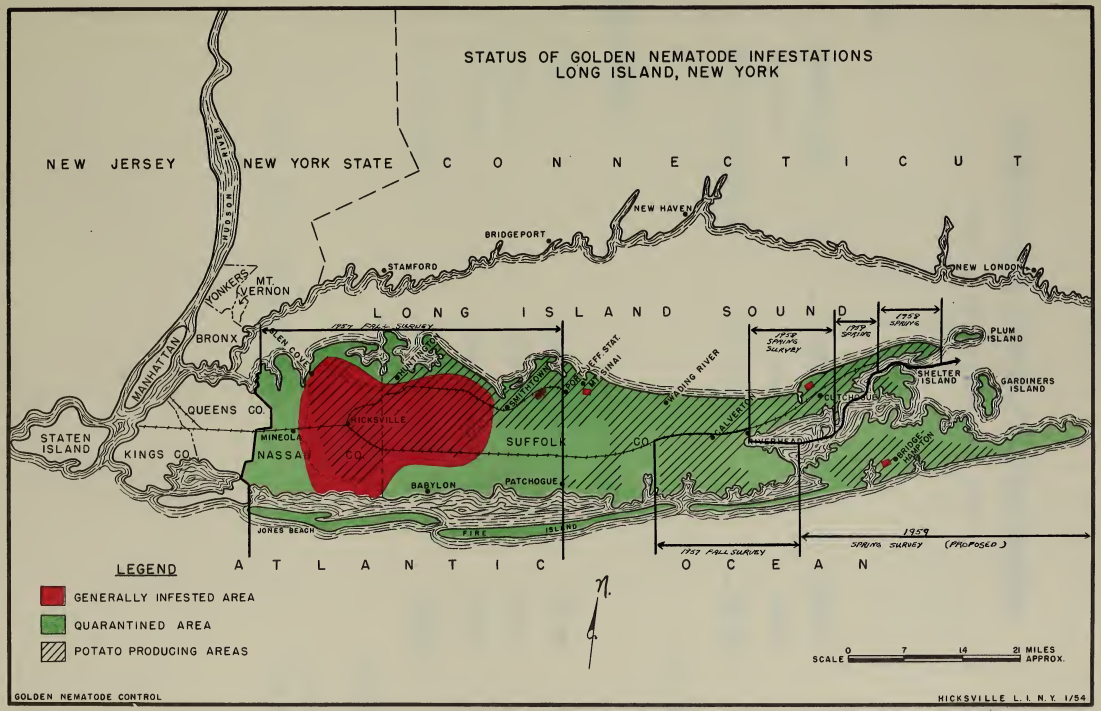
Quarantine and control measures now in effect in New York State should be continued in cooperation with the New York State Department of Agriculture and Markets, with the Division participating in an active manner as in the past.

D. Methods Improvement

The operation of soil washing machines used in the laboratory should be reviewed for possible improvements to control dust, to reduce the volume of water used and to decrease the amount of flotsam to be examined.

E. Associated Activities

The frequent requests for our participation in science fairs, exhibits and related activities suggests the need for a prefabricated golden nematode exhibit.


STATUS OF GOLDEN NEMATODE INFESTATIONS
LONG ISLAND, NEW YORK
NEW JERSEY
NEW YORK STATE
C O N N E C T I C U T
HUDSON
NEW HAVEN
BRIDGEPORT
STAMFORD
NEW LONDON
YONKERS
MT. VERNON
L O N G I S L A N D S O U N D
BRONX
MANHATTAN
1957 FALL SURVEY
1958 SPRING SURVEY
1959 SPRING
1959 SPRING
PLUM ISLAND
SHELTER ISLAND
GARDINERS ISLAND
QUEENS CO.
STATEN ISLAND
KINGS CO.
MINEOLA
HICKSVILLE
NASSAU CO.
SUFFOLK CO.
BABYLON
PATCHOGUE
JONES BEACH
FIRE ISLAND
ALVERTS
MATTITUCK
BRIDGEHAMPTON
1957 FALL SURVEY
1959 SPRING SURVEY (PROPOSED)
A T L A N T I C O C E A N
LEGEND
GENERALLY INFESTED AREA
QUARANTINED AREA
POTATO PRODUCING AREAS
N.
SCALE 0 7 14 21 MILES APPROX.
GOLDEN NEMATODE CONTROL
HICKSVILLE L. I. N. Y. 1/54

GPO 945935

TABLE #1

PROPERTIES FOUND INFESTED WITH GOLDEN NEMATODE

July 1, 1957 to June 30, 1958

NASSAU

Property No.	Operator	Acres	
13-A-105	J. Froehlich	28.00	
13-B-1,103,104,105	E. Harbes	153.00	
			181.00

SUFFOLK COUNTY:

1-B-7	Albert Schmidt	55.15	
3-C-2,3,4	John Wicks, Jr.	98.12	
14-C-21,22	Joseph Murray	76.47	
14-C-28,29,30	Lenzner Bros.	93.20	
			322.94

Total Nassau and Suffolk Counties . . . . . 503.94 Acres

TABLE #2

SUMMARY OF PROPERTIES AND ACREAGE ON LONG ISLAND, N.Y.
FOUND TO CONTAIN GOLDEN NEMATODE INFESTATION

June 30, 1958

	NASSAU COUNTY		SUFFOLK COUNTY		TOTALS	
YEAR	No. Of PROPERTIES	No. of ACRES	No. of PROPERTIES	No. of ACRES	No. of PROPERTIES	No. of ACRES
1941	2	115.66			2	115.66
1942	9	541.86			9	541.86
1943	8	437.36			8	437.36
1944	5	142.98			5	142.98
1945	5	165.88			5	165.88
1946	41	1,656.50			41	1,656.50
1947	52	2,793.28	1	30.00	53	2,823.28
1948	27	1,034.66	6	216.95	33	1,251.61
1949	22	663.00	7	350.15	29	1,013.15
1950	22	660.56	6	232.88	28	893.44
1951	16	544.75	10	302.80	26	847.55
1952	13	261.12	12	790.61	25	1,051.73
1953	8	167.43	19	989.20	27	1,156.63
1954	3	143.24	5	266.00	8	409.24
1955	2	130.00	3	85.30	5	215.30
1956			3	153.00	3	153.00
1957	1	7.92	7	263.70	8	271.62
1958	2	181.00	4	322.94	6	503.94
TOTALS	238	9,647.20	83	4,003.53	321	13,650.73

TABLE #3

STATUS OF GOLDEN NEMATODE INFESTATION
as of
JUNE 30, 1958

Confirmed Acreage Long Island	13,650.73		
Less: Developed for Real Estate	7,732.51		
Remaining Confirmed Acreage Available to Agriculture			5,918.22

- -

Classification of Land Available to Agriculture

Nassau County

Confirmed Acreage	9,647.20		
Less: Developed for Real Estate	7,297.83		
Remaining Confirmed Acreage Available to Agriculture		2,349.37	

Suffolk County

Confirmed Acreage	4,003.53		
Less: Developed for Real Estate	434.68		
Remaining Confirmed Acreage Available to Agriculture		3,568.85	
Remaining Confirmed Acreage Available to Agriculture Nassau and Suffolk Counties			5,918.22

- -

Quarantine "A" Land:

Nassau County	1,326.80		
Suffolk County	1,659.36		
Total "A" Land:		2,986.16	

Quarantine "B" Land:

Nassau County "B"	1,022.57		
Suffolk County "B"	1,909.49		
Total "B" Land:		2,932.06	
Total "A" and "B" Land			5,918.22

TABLE #4

GOLDEN NEMATODE

EASTERN REGION

FISCAL YEAR 1958

AREAS SURVEYED A	FIELD SURVEYED		GRADER SURVEY			INFESTATIONS		TOPSOIL MOVEMENT		TOTAL SERVICE CALLS
	B Acres	C Samples Collected	D Stations Visited	E Samples Collected	F Acres Represented	G Properties	H Acres	I Pits Operating	J Loads Moved	
Long Island										
Nassau County	2,379	5,001						28	12,158	48
Suffolk County	36,434	53,942						10	2,623	2,996
Total From July 1, 1957	38,813	58,943				6	504		14,781	3,044
Total From Beginning of Program	532,016	930,218				321	13,651		421,534	3,044
Other Areas by States										
Delaware			164	2,582	6,765					
Maryland	1	6	28	321	1,630					
New Jersey	22	54	346	1,921	6,663					
Virginia			69	1,455	18,135					
Total	23	60	607	6,279	33,193					
Total From Beginning of Program - L. I. Excluded X	108,054	92,089	10,769	94,841	609,984					

On December and June reports show:

(a) Acres removed by housing developments 7733 (from beginning of program), to June 30, 1958.

(b) Acres "A" land 2716 ("A" land is that portion of field in which golden nematode cysts have been found.)

(c) Acres "B" land 2698 ("B" land is that portion of an infested field in which golden nematode cysts have not been found.)

PPC Form 7-5 x Data for States in Other Regions excluded.

GOLDEN NEMATODE

* * *

PROGRAM ANNUAL REPORT
1956 FISCAL YEAR

* * *

GOLDEN NEMATODE

• • •

PROGRAM ANNUAL REPORT
1958 FISCAL YEAR

• • •

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

_____

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

Golden Nematode Survey

July 1, 1957 - June 30, 1958

Cooperating Agencies:

State Departments of Agriculture
Agricultural Experiment Stations
Agricultural Extension Service, and
California County Commissioners of Agriculture

October 30, 1958
Oakland, California

Jim R. Dutton
Regional Supervisor

TABLE OF CONTENTS

HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishment for the Fiscal Year

The golden nematode is not known to occur in the Western Region, although specimens have been intercepted in nursery shipments in California. Surveys have been conducted in the principal potato-producing areas of California, while soil samples from graders and storage sheds in the States of Washington, Oregon, and Idaho have been collected for processing.

State, County, and Division personnel in California collected 5,873 samples from 651 properties, representing 85,415 acres. In addition, 46 field samples were collected from 33 acres. The examination of the samples was completed without finding any suspicious nematodes.

Major Deviation from Work Plan

It had been planned to collect one sample from each ten acres; however, as the survey progressed, it became obvious that available time, manpower, and money would not permit this degree of coverage. Therefore, approximately one sample per 16½ acres was collected.

Status of Program at Close of Work Year

No golden nematode cysts were recovered during the examination of the samples. The majority of samples taken remained to be washed and examined at the close of the year.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

How planned and directed

The Area Supervisors of the various states in which the survey was to be conducted discussed the program with the states concerned, and agreed upon plans for the utilization of efforts of State and County Inspectors in the collection of samples.

Technical Assistance

Technical assistance provided to farmers and others by program personnel

Not applicable

Technical assistance provided to program by cooperating agencies

The California State Department of Agriculture, Bureau of Plant Pathology, provided a trained nematologist to assist in examination of flotsam in the laboratory.

Survey

Procedures or techniques used

Field

Soil is obtained from accumulations under the grader, under the loading belt, in storage bins, or in locations where potatoes are concentrated or have been stored. Moldproof paper bags are labeled with the sample number, name of owner, location, and date. Field samples were held to a minimum.

Laboratory

The laboratory employs washing machines, beakers, microscopes, and examining dishes. The soil from the sample is washed, and the flotsam collected in a pan with a fine mesh screen. It is then washed into a 600 ml. beaker and allowed to settle, the lighter material floating. The light material is then poured into a muffin screen, transferred to an examining dish, and allowed to float, for further examination under the microscope. Soil, water, and all debris are collected in a pit, where they are fumigated after examination in the laboratory and after the water has soaked into the ground.

Accomplishments

Samples collected in California were transported to a building at Minter Field, near Bakersfield, leased

by the Kern County Agricultural Commissioner, where they were processed with negative results. Samples collected in Idaho were processed at the National Guard Armory in Twin Falls, with negative results.

Statement or table of pest damage

No golden nematodes were found, nor was there any noticeable damage to crops.

Eradication or Control

Not applicable.

Regulatory

Not applicable.

Methods Improvement

Not applicable.

Other

Cooperation received during fiscal year

Cooperation was received from the California State Department of Agriculture, Bureau of Plant Pathology, and the counties involved. Personnel of the State and counties were well trained and cooperation was excellent.

The fresh fruit and vegetable inspectors of the State of Idaho materially aided in the collection of soil samples from graders.

Entomologists and plant pathologists of the States of Oregon and Washington assisted in collecting soil samples from storage cellars and graders in their respective states.

RECOMMENDATIONS FOR COMING YEAR

Survey

Since it is anticipated that survey for the golden nematode will be conducted at intervals of five years, it is recommended that the remaining states of the Region be surveyed during the next year.

GOLDEN NEMATODE PROGRAM

FISCAL YEAR 1958

LEGEND

AREAS SURVEYED

PRINCIPAL POTATO PRODUCING AREAS

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

GPO 977337

SUMMARY OF ASSOCIATED ACTIVITIES

Golden Nematode

Fiscal Year 1958

Area	Public Meetings Attended	Presentations					Feature & News Stories	Extent These Aids Were Used**				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.	Infest.Maps & Posters	
California	1	1	1						80			
Idaho	1	1	1						35			
Oregon	1	1	1						35			
Washington	1	1	1						40			
Total	4	4	4						190			

* Written by Federal personnel for release direct or through cooperators.

** This should be a conservative estimate (accurate record for these items impractical).

STATISTICAL SUMMARY

Golden Nematode

Fiscal Year 1958

Areas Surveyed A	Field Surveyed: Acres B	Field Surveyed: Samples Collected C	Grader Survey: Stations Visited D	Grader Survey: Samples Collected E	Grader Survey: Acres Represented F
California	33	52	651	5,873	85,415
Idaho	0	0	1,053	7,638	118,573
Oregon	0	0	386	1,671	27,417
Washington	0	0	188	1,759	30,938
Total This Period	33	52	2,278	16,941	262,343
Total From July 1	33	52	2,278	16,941	262,343
Total From Beginning of Program	5,390	3,720	6,162	74,454	728,164

EXPENDITURES BY SOURCE AND ACTIVITY

Golden Nematode

Fiscal Year 1958

Source of Cash & Equivalent*	1 Planning & Direction	2 Technical Assistance	3 Survey	4 Control	5 Regulatory	6 Methods Improvement	7 Other	8 Total
Plant Pest Control Division	$ 1,460	$ 2,320	$ 13,039					$ 16,819
Other Organizations (Name)								
California	950	1,200	879					3,029
Idaho	100		900					1,000
Oregon								
Washington								
Subtotal - Other Organizations	1,050	1,200	1,779					4,029
Total (of PPC & Other)	2,510	3,520	14,818					20,848
Contributed Services**								
California Counties	125		755					880
Oregon	100		200					300
Washington	100		200					300
Total	325		1,155					1,480
Grand Total	$ 2,835	$ 3,520	$ 15,973					$ 22,328

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

COOPERATIVE AID RECEIVED

Golden Nematode

Fiscal Year 1958

	1	2	3	4	5	6	7	8
State and Source of Aid	Cash and Equivalent Aid*				Total of Cash & Equivalent	Intangible Service Estimate**	Source Grand Total	Remarks
	Cash	Personal Services	Equipment & Supplies	Space				
California		$ 3,029			$ 3,029	$	$ 3,029	
California Counties						880	880	
Idaho		1,000			1,000		1,000	
Oregon						300	300	
Washington						300	300	
Total This Period		$ 4,029			$ 4,029	$ 1,480	$ 5,509	

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
CENTRAL REGION

ANNUAL PROGRAM REPORT

GRASSHOPPER CONTROL

July 1, 1957 - June 30, 1958

In cooperation with other

Federal, State, County, and Local Agencies

November 14, 1958
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

TABLE OF CONTENTS

I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

A. Accomplishment for the fiscal year

Farmers in the infested crop areas of the Region kept grasshopper damage to cultivated crops at a minimum by the timely application of recommended insecticides. Most of the voluntary control work performed was on a local basis in parts of Kansas, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin.

Cooperatively conducted rangeland programs involving 106,076 acres of State and private lands were completed in southeastern and western North Dakota and in the southwest corner of the Nebraska sandhills. Control on Government land was done on 48,072 acres in Williams, Golden Valley, Ransom, and Richland Counties, North Dakota, and in the Black Hills National Forest of western South Dakota.

In western Kansas, under a Federal-County-Roadside cooperative program, 112,925 acres were sprayed in eighteen counties, with 6,714 acres of railroad rights-of-way being treated under a cooperative Federal-Railroad Company program in the same general area. The Kansas State Highway Department cooperated with the Division in the treatment of 3,133 acres of Federal-State highways not included under the Federal-County programs.

B. Major deviations from work plan

Weather and other natural factors reduced to a minimum the need for control in the "local" infestations of Illinois, Michigan, and Missouri, and only very little control was necessary in the infested portions of Minnesota.

The infestations scheduled for control in the rangeland areas of the Black Hills section of South Dakota did not materialize due to the spotty nature of the hatch and failure of landowners to indicate united interest in a cooperating program.

During the late fall of 1957, Melanoplus bilituratus migrated into the crop and range areas of western Kansas. To meet this threat to crops in the area and to minimize possible migrations of this grasshopper into other non-infested areas in Kansas and adjoining states, in fiscal year 1959, cooperatively conducted control programs were developed to cope with the problem. Infested roadsides were treated by air or ground equipment under Federal-County-Roadside programs. Railroad rights-of-way were sprayed by aircraft and Federal-State highways not included under the Federal-County programs were treated by ground equipment. The cost of the work under all three programs was: non-Federal, two-thirds; the Federal Government, one-third. The landowner paid the entire cost of treating the infested cropland areas within the counties where

roadside and railroad control work was performed. Plant Pest Control Division and State officials provided survey information and technical control assistance to the farmers concerned and actively supervised the organized control undertakings.

C. Status of program at close of year

The over-all problem for the Region in 1959, based upon adult survey evaluations, is somewhat less than was indicated for the calendar year 1958. Threat to crops will be greatest in central Wisconsin, central and northeastern South Dakota, southwestern Nebraska, west-central and southwestern Kansas, with spotty infestations in northwestern and southwestern North Dakota, northwestern and southwestern South Dakota, and west-central, east-central, and southeastern Minnesota. The rangeland infestations are largely confined to private and state land in west-central Nebraska and minimum acreage of forest land in southwestern South Dakota.

II. PROGRAM ACTIVITIES DURING FISCAL YEAR

A. Planning and direction

All planning and direction is contingent upon the scope of the problem. Based upon survey information, grasshoppers in numbers capable of damaging crops were expected in 1958 in crop areas of central Wisconsin, central, northwestern, and southeastern Minnesota, northeastern South Dakota, north-central and southwestern North Dakota, southeastern and northeastern Kansas. Infestations to rangeland were expected in west-central North Dakota, west-central South Dakota, and the southwestern portion of the Nebraska sandhill area.

The survey information was provided by Division personnel and the cooperating State officials, including heads of departments and State and Extension entomologists, to interested county agents, farm and rancher groups, newspapers, and other suitable agencies of communication. These same officials kept the farmer and rancher currently informed regarding the results of the nymphal checks made as the hatching of the grasshoppers occurred in the spring. This information enabled proper adjustment of control plans in areas where grasshoppers threatened crops, or required control under Federal-State-Rancher cooperative programs. Orderly planning of this type enables control practices to be performed with maximum results.

B. Technical assistance

Division personnel and cooperating State officials provided timely survey information and technical control assistance. County agents and Extension entomologists were especially active in rendering

this service. All Federal-State-Landowner rangeland undertakings are the result of very close cooperation between the landowners concerned working through selected rancher committees, county agents, Extension and other State officials, and Plant Pest Control personnel. The Federal Government also assists in the financing of grasshopper control on rangeland.

C. Survey

Procedures or techniques used

Effective control is based upon knowledge of the nature and scope of the problems. Each year the necessary information is secured through surveys cooperatively planned and executed by Division and State personnel. The adult grasshopper survey is made in late summer, after most grasshoppers have become adults. The purpose of the survey is to learn location, population, and species of grasshoppers. Their offspring constitute the infestations needing control attention the following field season. The egg survey is made in the late fall, after egg deposition by the adult grasshoppers is completed. This survey is more difficult and time-consuming than the adult survey. The purpose is to determine whether the infestation expected the subsequent year will be the same, greater, or less than was shown by the adult survey, and also whether a shifting of adults after completion of the adult survey has changed the infestation picture. The egg survey is usually conducted only in areas where the adult survey revealed an expected economic infestation.

The third, or pre-control nymphal survey, is made in the spring, after the eggs hatch, to evaluate the degree of survival of these pests. The information obtained from the nymphal survey is the basis for making final control recommendations.

All necessary adult, egg, and nymphal surveys were conducted as required throughout the Region this year. Appropriate Division and State officials provided interested county agents, farmers, and ranchers with accurate survey information on an area, county, and local level, enabling proper and timely control measures to be applied for maximum results.

D. Eradication or control

Procedures or techniques and accomplishments

In harmony with established policy, farmers pay all cost of grasshopper control in cropland areas. The work this year was done for the most part on an individual-farmer basis. Community action was largely restricted to local areas in North Dakota. In western Kansas, control of grasshoppers on roadsides, railroad rights-of-way, and some Federal-State highways was directed and supervised by Division personnel, with State and county officials cooperating.

The financial breakdown was two-thirds non-Federal and one-third Federal. In Kansas, under the Federal-county and highway programs, the following acreages were treated:

Federal-County Program	18 counties	112,925	acres
Federal-Railroad Program	18 counties	6,714.48	acres
Federal-State Highway Program	6 counties	3,133	acres
		122,772.48	acres

Where rangeland work was performed, the control approach was through the regularly organized Federal-State-Rancher program. Total acres of infested rangeland treated this year under cooperative programs was 154,148 acres in the states of Nebraska, North Dakota, and South Dakota. The breakdown of programs included: Garden and Keith Counties, Nebraska, 99,940; Golden Valley, Williams, Williston, Ransom, and Richland Counties, North Dakota, 53,648; and the Black Hills National Forest, South Dakota, 560.

E. Regulatory

All grasshopper program work is performed on a voluntary basis by all parties concerned. No regulatory action is involved.

F. Methods improvement

This year, as has been the policy for many years, Division personnel cooperated very closely with the Methods Improvement Section, Plant Pest Control; and the Entomology Research Division, Agricultural Research Service, Washington, D. C., for recommended mechanical, cultural, or chemical improvement or adjustment in grasshopper control techniques. Area Plant Pest Control personnel also often conferred with State Experimental Station workers and others interested in the problem.

Contracts used this year followed the recommendations received from Methods Improvement Section, Plant Pest Control Division, Washington, D. C.

G. Other

The cooperation received from individuals, agricultural groups, allied agencies, and interested county, State, and Federal agency officials was satisfactory and varied little from previous years.

When grasshoppers became a threat to the crops in western Kansas, it was gratifying to the Division officials in the Kansas-Nebraska area and the Regional office to find active interest and support from farmers, county officials, State officials, publicity agencies, business, railroads, and other allied State agencies, including the Fish and Wildlife Service and the Highway Department. Each group or agency assumed its fair share of the job, morally

and financially. This same support was likewise evidenced where cooperative rangeland control was undertaken in Nebraska, North Dakota, and South Dakota.

Information covering voluntary work in most states within the Region is not available for this report. Indications, however, support the assumption that for the most part farmers did what control was necessary to protect their crops from extensive grasshopper damage. Based upon known infestations, most voluntary work accomplished during the year occurred in the states of North Dakota, South Dakota, and Wisconsin. Only minimum control was necessary in Minnesota and other states with "local" infestations.

III. RECOMMENDATIONS FOR COMING YEAR

A. Division and cooperating State personnel in the areas threatened by M. bilituratus should be alerted to making adequate nymphal surveys during the spring of 1959, enabling the development of proper control plans in advance of actual control operations.

Survey procedures and techniques appear generally adequate and satisfactory; however, it should be remembered that as few as 3 to 5 grasshoppers, when attacking fall wheat plantings, are capable of considerable marginal damage to newly planted wheat. Under ordinary conditions, less than 3 per square yard in the field and 10 in margins are considered non-economic. Possibly this information should become a part of the survey instructions for areas in the wheat sections of the west.

B. Control procedures during the past year met the field conditions which developed in the Region. The Federal-County-Roadside program, which became effective in western Kansas during the last half of this fiscal year, proved very effective against the M. bilituratus which infested that section of the Central Region during late fall of 1957.

C. Not applicable.

D. Not applicable.

E. See Table 6.

IV. APPENDIX

A. Maps

Each year two maps are prepared by the Division. The one is entitled "Grasshopper Adult Survey - Fall 19__" and the second "Rangeland Grasshopper Control, Location and Size of Areas Cooperatively Treated May-September 19__." These maps are distributed generally throughout the grasshopper area of this Region and are therefore not included in this report.

Table 1 - Cooperative Railroad Rights-of-way Spraying

Kansas Grasshopper Control Program - Fiscal Year 1958

Railroad	Aerial Application*			Cost per Acre	Railroad Share	PPCD One-third Share	Total Cost
	Miles Sprayed	Acres per Mile	Acres Sprayed				
Atchison, Topeka and Santa Fe	286	12.12	3,466.32	$0.96	$2,218.45	$1,109.22	$3,327.67
Rock Island	24	12.12	290.88	0.96	186.16	93.08	279.24
Missouri Pacific	93	12.12	1,127.16	0.96	721.38	360.69	1,082.07
Union Pacific	96	12.12	1,163.52	0.96	744.65	372.33	1,116.98
Chicago, Burlington and Quincy	55	12.12	666.60	0.96	426.63	213.31	639.94
TOTALS	554		6,714.48		$4,297.27	$2,148.63	$6,445.90

*Counties in which spraying was done:
Cheyenne, Finney, Gove, Grant, Greeley, Hamilton, Haskell, Kearney, Lane, Logan, Morton, Rawlins, Scott, Seward, Stanton, Stevens, Wallace, Wichita.

Table 2 - Cooperative Roadside and Federal-State-Highway Spraying
Kansas Grasshopper Control Program - Fiscal Year 1958

County	Period of Operation	Total Acreage Treated	Costs: Insecticide	Costs: Ground Application per Acre	Costs: Aerial Application per Acre	Costs: Total Application Cost	Total Cost	PPCD Participation: Dollars	PPCD Participation: Rate
Cheyenne	6/9-28	5,520	$ 1,199.73	$0.309	--	$ 1,705.68	$ 2,905.41	$ 968.47	1/3 total cost
Clark	6/13-7/9	3,240	807.50	0.55	--	1,782.00	2,589.50	810.00	$0.25 per acre
Comanche	6/16-20	8,854	2,908.29	--	$0.3953	3,500.00	6,408.29	2,136.10	1/3 total cost
Gove	6/12-30	5,030	1,425.00	0.53	--	2,665.90	4,090.90	1,257.50	$0.25 per acre
Grant	6/14-26	11,250	3,156.47	--	0.849	9,551.25	12,707.72	2,812.50	$0.25 per acre
Greeley	6/14-28	14,320	3,064.00	0.45	--	6,444.00	9,508.00	3,169.33	1/3 total cost
Haskell	6/14-16	11,700	--	--	1.10*	12,870.00	12,870.00	2,925.00	$0.25 per acre
Kearney	--	2,616	830.00	--	0.75	1,962.00	2,792.00	654.00	$0.25 per acre
Lane	6/9-24	4,536	1,902.60	0.33	--	1,496.88	3,399.48	1,134.00	1/3 total cost
Logan	6/10-28	4,942	917.40	0.36	--	1,779.12	2,696.52	898.84	1/3 total cost
Morton	6/12-27	1,062	380.20	0.40	--	128.00**	508.20	169.40	1/3 total cost
Rawlins	6/14-26	9,698	--	--	1.00* & 1.20*	10,229.55	10,229.55	2,424.56	$0.25 per acre
Scott	6/16-20	9,220	--	--	0.80	7,376.00	7,376.00	2,305.00	$0.25 per acre
Seward	6/11-19	6,688	2,863.93	--	1.25	8,360.00	11,223.93	1,672.00	$0.25 per acre
Stanton	6/12-30	821	242.25	0.75	--	615.75	858.00	205.25	$0.25 per acre
Stevens	6/10-27	3,900	1,312.00	--	0.50	1,950.00	3,262.00	975.00	$0.25 per acre
Wallace	6/3-30	4,280	1,091.25	0.37	--	1,583.60	2,674.85	891.62	1/3 total cost
Wichita	6/10-24	5,248	1,365.36	0.375	--	1,968.00	3,333.36	1,111.12	1/3 total cost
Federal-State Highways	June	3,133	2,154.60	--	--	--	--	2,154.60	Insecticide & 3 trucks w/ Buffalo turbine sprayers
Totals		116,058	25,620.58***			$75,967.73	$99,433.71	$28,674.29	

*Includes cost of insecticide.
**742 acres treated by farmers of Morton County at no cost of application to the county.
***56,032 acres treated by ground equipment; 60,026 by contract aircraft.

Table 3 - Total Acres of Rangeland Treated for the Control of Grasshoppers
Fiscal Year 1958

State	Private and State Lands (Acres)	Federal Lands (Acres)	Total Acreage
Nebraska	99,940	-	99,940
North Dakota	6,136	47,512	53,648
South Dakota	-	560	560
Totals	106,076	48,072	154,148

Table 4 - Cooperative Rangeland Grasshopper Control
Federal Land Ownership - Fiscal Year 1958

State	Area	Period of Control Operation	Land Ownership (Acres) USDI	Land Ownership (Acres) USDA	Total Acres
North Dakota	Golden Valley Co.	7/9 - 10/57	-	180	180
	Garrison Reservoir Area Williams Co.	7/12 - 20/57	400	-	400
	Ransom-Richland Co.	7/16-25/57	-	46,932	46,932
South Dakota	Black Hills National Forest	7/1-8/1/57	-	560	560
Totals			400	47,672	48,072

Table 4 - Cooperative Rangeland Grasshopper Control Operation
Acreage Sprayed and Costs - Fiscal Year 1958

State and Location	Period of Control Operation	Acreage Sprayed: Contract Aircraft	Acreage Sprayed: Ground Equipment	Total Acres Treated	Costs: States Counties Landowners	Costs: Other Coop. Federal Agencies	Costs: PPCD	Total Cost	Average Cost per Acre
Nebraska									
Garden & Keith Cos.	7/8-20/57	99,940	-	99,940	$32,925.10	-	$16,462.55	$49,387.65	$0.494
North Dakota									
Golden Valley Co.	7/9-10/57	-	180	180	20.00	-	125.68	145.68	1.14
Williams Co.	7/12-20/57	-	400	400	40.00	-	738.81	778.81	1.94
Ransom & Richland Cos.	7/16-25/57	53,068	-	53,068	2,197.27	-	23,886.03	26,083.30	0.496
South Dakota									
Black Hills National Forest	7/1-8/1/57		560	560	100.00	100.00	487.10	687.10	1.24
Totals		153,008	1,140	154,148	$35,282.37	$100.00	$41,700.17	77,082.54	

Table 5 - Accomplishments, Fiscal Year 1958 - Grasshopper Control

State	Status First of Period	*Infested Acres: State and Private	*Infested Acres: Public Domain	*Infested Acres: Total Acreage	Acreage Treated: State and Private	Acreage Treated: Public Domain	Acreage Treated: Total Acres
Kansas	-	-	-	-	128,219	-	128,219
Nebraska	-	-	-	-	103,064 a/	-	103,064 a/
North Dakota	-	-	-	-	8,610 b/	54,362 c/	62,972 d/
South Dakota	-	-	-	-	-	560	560
Totals	-	-	-	-	239,893	54,922	294,815

a/ Includes 3,124 acres resprayed.
b/ Of this total, 2,474 was included in 1957 annual report.
c/ Of this total, 6,850 was included in 1957 annual report.
d/ Of this total, 9,324 was included in 1957 annual report.

*Figures in these columns cumulative for one month only. No fiscal-year data.

Table 6 - Summary of Associated Activities, Grasshopper Control - Fiscal Year 1958

State	Public Meetings Attended	Presentations: Talks	Presentations: Slides	Presentations: Films	Presentations: Radio	Presentations: TV	Feature* & News Stories	Extent These Aids Were Used**: Exhibits	Bulletins	Circulars	Infest. Maps & Posters	Other
FEDERAL												
Iowa	-	-	-	-	-	-	-	-	4	-	-	
Kansas	5	5	-	4	-	-	1	-	-	-	200	
Michigan	-	-	-	-	-	-	-	-	640**	-	-	
Minnesota	34	34	3	-	-	-	-	1	-	-	-	
Missouri	-	-	-	-	-	-	-	-	3	-	-	
Nebraska	17	17	6	5	-	1	2	2	200	-	250	
N. Dakota	5	2	-	-	-	-	-	-	-	-	150	
S. Dakota	12	7	7	6	3	-	2	10	1,000	-	150	
Wisconsin	-	-	-	-	-	-	-	-	5	-	1,300	
Subtotals	73	65	16	15	3	1	5	13	1,852	-	2,050	
COOPERATORS												
Illinois	-	-	-	-	-	-	-	-	-	-	27	
Indiana	-	-	-	-	-	-	-	-	-	-	5	
Kansas	10	10	-	8	-	-	-	-	-	-	-	
Michigan	-	-	-	3	-	-	-	-	-	-	-	
Minnesota	-	-	-	9	-	-	-	-	-	-	500	
Missouri	4	4	2	-	-	-	3	-	-	-	-	
Nebraska	45	45	-	-	-	2	2	-	-	-	-	
N. Dakota	7	4	1	-	-	-	-	-	100	-	150	
S. Dakota	5	4	3	2	3	1	3	-	1,500	-	150	
Wisconsin	-	-	-	-	-	-	4	-	-	-	-	
Subtotals	71	67	6	22	3	3	12	-	1,600	-	832	
GRAND TOTALS	144	132	22	37	6	4	17	13	3,452	-	2,882	

*Written by Federal personnel for release direct or through cooperators.
**Conservative estimate.

Cooperative Aid Received - Fiscal Year 1958
Grasshopper Control

State	Cash or Equivalent Aid *				Total of Cash & Equiv.*	Intangible Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Illinois	$ 1,132	$ 0	$ 0	$ 0	$ 1,132	$ 0	$ 1,132
Indiana	388	0	0	0	388	0	388
Iowa	0	700	0	0	700	1,150	1,850
Kansas	93,078	0	0	0	93,078	2,240	95,318
Minnesota	0	1,455	475	472	2,402	25,300	27,702
Missouri	0	1,800	400	100	2,300	2,550	4,850
Nebraska	32,925	0	0	0	32,925	1,600	34,525
North Dakota	77,424	10,000	0	0	87,424	20,000	107,424
South Dakota	0	5,500	0	0	5,500	1,000	6,500
Wisconsin	0	1,431	0	0	1,431	2,000	3,431
Totals	204,947	20,886	875	572	227,280	55,840	283,120

*Limited to direct appropriation, allotments from other sources, services, and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available.

Expenditure by Source and by Activity - Fiscal Year 1958 - Grasshopper Control

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
CASH & EQUIVALENT*								
Plant Pest Control Division	$10,950	$17,070	$33,050	$100,020	$ 0	$ 440	$1,020	$162,550**
Other Organizations:								
Illinois	0	0	1,132	0	0	0	0	1,132***
Indiana	0	0	388	0	0	0	0	388***
Iowa	100	150	450	0	0	0	0	700
Kansas	0	0	0	93,078	0	0	0	93,078
Minnesota	0	1,005	0	0	0	0	1,397	2,402
Missouri	200	100	1,600	300	0	0	100	2,300
Nebraska	0	0	0	32,925	0	0	0	32,925
N. Dakota	0	0	0	77,424	0	0	0	77,424
Wisconsin	0	0	1,431	0	0	0	0	1,431
Subtotals	300	1,255	5,001	203,727	0	0	1,497	$211,780
CONTRIBUTED SERVICES****								
Iowa	0	1,150	0	0		0	0	1,150
Kansas	740	500	1,000	0	0	0	0	2,240
Minnesota	2,000	15,500	1,800	6,000	0	0	0	25,300
Missouri	0	2,550	0	0	0	0	0	2,550
Nebraska	0	1,600	0	0	0	0	0	1,600
North Dakota	15,000	7,500	7,000	0	0	500	0	30,000
South Dakota	2,000	2,500	1,500	0	0	500	0	6,500
Wisconsin	0	1,500	500	0	0	0	0	2,000
Subtotals	$19,740	$32,800	$11,800	$ 6,000	0	$1,000	0	$ 71,340
GRAND TOTALS	$30,990	$51,125	$49,851	$309,747	0	$1,440	$2,517	$445,670

**Includes funds for Federal chinch bug survey as follows: Ill. - $576; Ind. - $200.
***Includes Natural History survey, chinch bug: Ill. - $179; Ind. - $320. *Actual cash expenditure.
****Limited to services incidental to other activities for which only an estimated value is available.

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

GRASSHOPPER

July 1, 1957 - June 30, 1958

In cooperation with other
Federal, State, County, and Local Agencies

November 15, 1958
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

Flights of migratory grasshoppers invaded the Oklahoma and Texas panhandles during the late summer and fall of 1957, causing considerable damage to the margins of fall-seeded wheat and requiring farmers in Oklahoma to treat an estimated 145,000 acres for crop protection. Grasshopper adult surveys conducted in the fall of 1957 indicated that a "threatening" to "severe" grasshopper infestation could be expected in 1958 on rangeland, roadsides, and along field margins in 6 counties of the Oklahoma panhandle and 26 counties in the Texas panhandle. Nymphal surveys conducted in the spring of 1958 confirmed these findings.

In cooperation with ranchers, state authorities, and the Agricultural Extension Service, cooperative control operations were organized in both Oklahoma and Texas. At the end of the season, a total of 1,173,956 acres of rangeland, roadsides, railroad rights-of-way, fence rows, and Soil Bank lands had been treated with good results.

B. Major Deviation from Work Plan

1. Due to the severity of the infestation, the size of the area involved, and the migratory tendencies of the grasshoppers, the cooperatively financed rangeland control program was extended to include small grasslands extending into predominant cropland areas, roadsides, fence rows, railroad rights-of-way, and Soil Bank lands where community-wide voluntary cropland control programs were undertaken.

2. The Division fully financed control operations on Land Use lands under the U. S. Forest Service supervision which were intermingled with privately-owned rangeland scheduled for control.

C. Status of Program at close of year

At the close of the 1958 season, a total of 1,609,030 acres of rangeland in the Oklahoma panhandle and 3,353,054 acres of rangeland in the Texas panhandle was known to be infested with grasshoppers. Approximately 232,000 acres in Oklahoma and 600,000 acres in Texas were listed for control under agreements initiated in fiscal year 1958. The major portion of the cropland field margins in the Oklahoma and Texas panhandles and adjacent areas has grasshopper populations in sufficient number to warrant control measures to protect young sorghum plants and fall-seeded wheat.

II. Program Activity during fiscal year

A. Planning and Direction

1. How planned and directed

In areas where surveys showed that damaging infestations of grasshoppers were liable to develop and where organized control programs were requested, federal, state, county, and Extension Service personnel assisted in organizing rancher committees and advised on control measures that should be undertaken. Where cooperative control operations were undertaken, county officials and rancher committees made all arrangements for landowner sign-up, collection of rancher funds, and the disbursement of these funds. Division, state, and county personnel supervised the application of insecticide and checked on mortality. In counties outside the scheduled control area, cooperative agreements were made with the county governing body. Several counties with limited federal and state assistance made all arrangements for the control operations and were reimbursed by the Division for one-third of the cost (not to exceed 25¢ per acre) upon satisfactory completion of the program.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Educational meetings, demonstrations, newspaper articles, and program aids provided the means of informing farmers and ranchers as to the nature and scope of the problem, the development of infestations, and recommended control practices. Community-wide cropland control programs were organized and farmers were advised on timing of applications, kinds of insecticides, dosages required, and type of equipment needed.

2. Technical assistance provided to program by cooperating agencies

Assistance was provided in arranging and conducting educational and organizational meetings, surveys, species identification, supervisory assistance on control operations, and assistance in the technical phases of control measures.

C. Survey

1. Procedures or techniques used

a. Field

Grasshopper adult, egg, and precontrol nymphal surveys were made by cooperating state and federal personnel on

range and croplands. These surveys determine in advance the general infestation picture and provide a basis for the planning of control measures. Information for mapping infestations is derived in part from the results of the adult survey and in part from the surveyor's immediate knowledge of areas known to be infested or involved.

The purpose of the egg survey is to determine whether the infestations in the succeeding year will be the same, greater, or less than that shown by the adult survey and whether migration of adults after the adult survey has changed the infestation picture. The egg survey is normally conducted only in areas where the adult survey revealed expected economic infestations. The nymphal survey is made in the spring after grasshoppers hatch to determine the degree of survival of the young hatching grasshoppers. From this data and other integrated and pertinent information, final control plans are formulated. After the planned control program has been accomplished, an additional survey is made to evaluate and determine the effectiveness of the work.

b. Laboratory

New or unusual species of grasshoppers collected during the adult survey were identified, and individual species population densities were determined.

2. Accomplishments

Adult surveys were conducted in 59 Oklahoma counties and 98 Texas counties in the fall of 1957. These surveys indicated that 6,262,000 acres of rangeland could be infested in 1958. Egg surveys conducted in the more severely infested areas indicated that a heavy egg deposition had taken place, particularly by grasshoppers which had migrated into the area after completion of the adult survey. Nymphal surveys in the spring of 1958 determined that nymphal survival had been high and that damaging numbers of grasshoppers existed on 4,962,084 acres of rangeland in the two states.

3. Statement or table of pest damage

Grasshoppers migrating into the Oklahoma and Texas panhandles in the fall of 1957 caused severe marginal damage to fall-seeded wheat. Many farmers were required to replant the edges of their fields from two to three times. Abundant rainfall in the spring or the early summer of 1958 resulted in a lush vegetative growth and, coupled with a timely and effective control program, minimized grass damage on rangeland. In most cropland areas, the wheat harvest was well

under way by the time grasshoppers reached maturity and measurable damage occurred only in isolated instances. However, severe losses occurred in late June by grasshoppers migrating from untreated, dry, weedy vegetation to young cotton and sorghum plantings.

D. Eradication or Control

1. Procedures or techniques used

Grasshopper control on private rangeland was financed two-thirds by the state and individual ranchers and one-third by the Plant Pest Control Division. On federally-owned rangelands where grazing was on a permit basis of 6 months or less, control operations were carried on at full federal expense. Control operations on rangeland were generally confined to blocks of 25,000 acres or more. The control materials were applied by aircraft under contract.

Control of grasshoppers in cropland areas was by voluntary control measures on the part of each individual farmer. Cooperating state and federal personnel assisted in organizing community-wide control measures and provided survey information and technical advice to the farmer.

In counties lying within the area generally infested with migratory grasshoppers and where farmers voluntarily controlled grasshoppers in their crops, a cooperative program to treat the noncrop area was undertaken. This involved the spraying of roadsides, small grassland areas intermingled with cropland, and Soil Bank lands. The Plant Pest Control Division contributed one-third of the control cost by furnishing equipment, supervision, and control materials.

In some Texas counties with heavy grasshopper populations and outside the general control areas, the Plant Pest Control Division entered into cooperative agreements with the county governing body whereby the county would organize the program and underwrite the cost of treatment on small, heavily infested pockets of infestation. Limited supervision was provided by the Division. Upon satisfactory completion of the program, the Division reimbursed the county in an amount equivalent of one-third the cost of application and insecticides not to exceed 25¢ per acre.

The insecticides used in cooperatively conducted rangeland programs consisted of 2 ounces of actual aldrin or heptachlor and sufficient No. 2 diesel oil to make

one gallon. The rate of application of this solution amounted to approximately 1 gallon per acre. Along roadsides and railroad rights-of-way where heavy vegetative cover was encountered and the insecticide was applied by ground equipment, a dosage of 2 to 4 ounces of aldrin or heptachlor was applied as a water emulsion at the rate of 3 to 5 gallons per acre.

2. Accomplishments

A total of 848,379 acres of rangeland, including 77,000 acres of federal lands, was treated in 6 counties in Texas. In Oklahoma, 235,407 acres of rangeland were treated in 2 counties. In addition to the rangeland control operation, 7,131 acres of roadsides were treated in 1 county in Oklahoma and 14,069 acres in 6 counties of Texas. Additional acreage totaling 68,970 acres was treated in 8 Texas counties on county contracts under cooperative agreements with the Plant Pest Control Division. Farmers, on a voluntary basis, treated 145,000 acres of range and cropland in Oklahoma, and 198,022 acres in Texas.

E. Regulatory

None.

F. Methods Improvement

1. Work performed

Personnel of the Plant Pest Control Division's Methods Improvement Section made a most worthwhile contribution to the improvement of control by making arrangements for the necessary equipment required and the supervision of such equipment. They maintained overall supervision of aircraft and ground equipment, determining their suitability and operational limitations.

2. Accomplishments

The efficiency of the program was materially increased by the use of an area-wide communications system. Modifications were made to several types of sprayers to obtain a higher degree of efficiency under existing conditions. Demonstrations were made of various types of control techniques and the operation of new and improved equipment. Insecticide analyses were made prior to application to ensure uniform, full strength, insecticidal material. Careful supervision of aircraft application minimized skips and other application errors, thus significantly increasing grasshopper mortality.

G. Other

1. Cooperation received during fiscal year

a. Major contributions received and importance to program (other than funds)

The Agricultural Extension Service rendered valuable assistance in stimulating control efforts. County commissioners willingly assisted in providing funds, equipment, and personnel for the treatment of infestations along roadsides and other uncultivated areas which posed a threat to adjacent croplands. The Departments of Agriculture in the states involved furnished an abundant supply of personnel to assist in the supervision and carrying out of technical phases of the work. The Texas National Guard provided needed vehicular equipment. The chemical industry stockpiled adequate supplies of insecticides in strategic points throughout the infested area. The U. S. Forest Service willingly provided assistance in the surveying and mapping of federal lands. The U. S. Weather Bureau provided special weather information on a round-the-clock basis, and the Civil Aeronautics Administration cooperated in assuring that aircraft fully met all airworthiness requirements and that pilots were licensed and qualified according to their regulations.

b. Cooperative work needing strengthening another year

Farmer participation in community-wide voluntary grasshopper control should be strengthened especially in areas where cooperative financing is available for control on roadsides, grassland intermingled with cropland, and Soil Bank land.

2. Associated activities and services

Extensive use was made of the services of newspapers, radio, and television to keep interested farmers and ranchers fully informed of the progress of the program.

III. Recommendations for coming year

A. Survey

A nymphal survey to determine the development of second generation Melanoplus bilituratus grasshoppers in the Oklahoma and Texas panhandles should be made during the late summer. A second adult survey should be conducted during the early fall in the same area for information on grasshopper migration and the effect of the second generation on the overall population.

B. Eradication or control

Present recommended controls for range grasshoppers should be confined to use on short grass ranges. Areas where heavy annual vegetation or Johnson grass pastures exist should be excluded from a typical rangeland program.

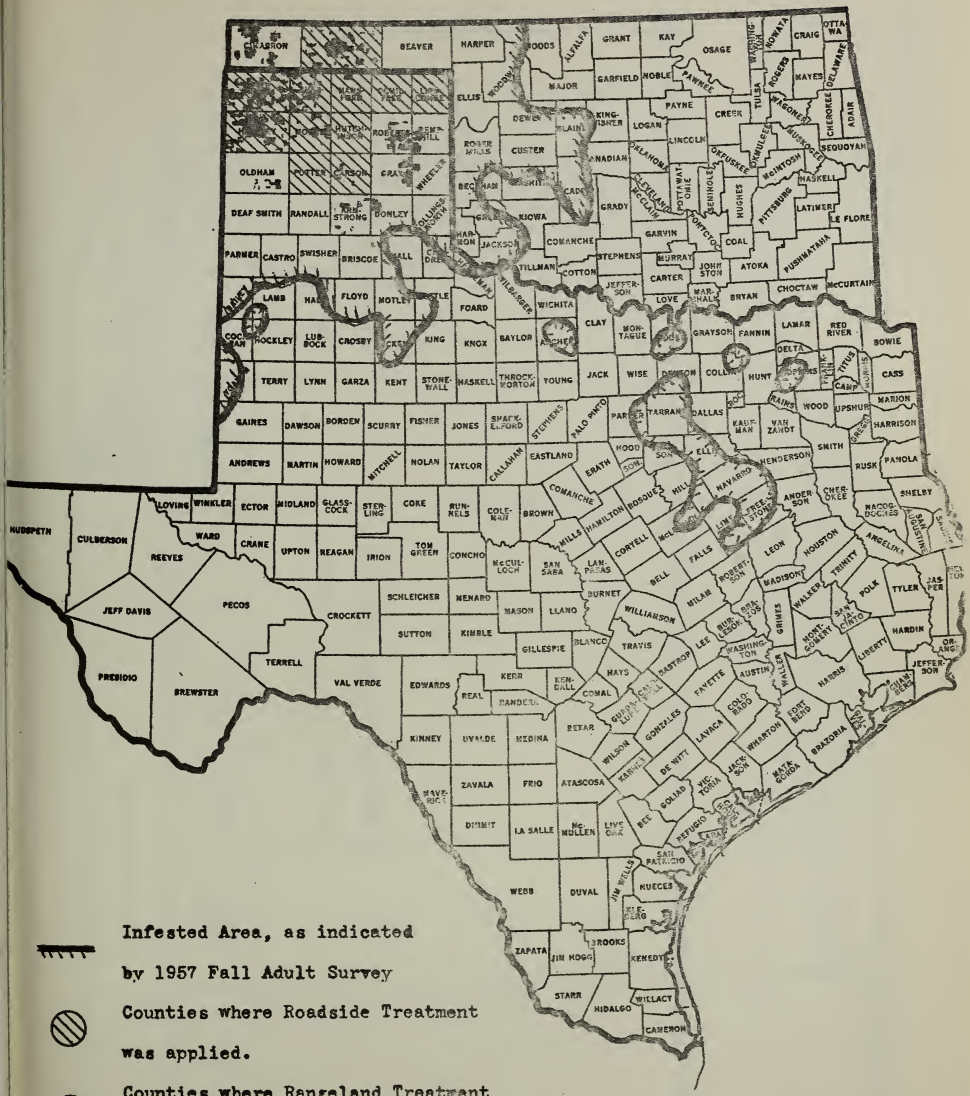
C. Regulatory

None.

D. Methods Improvement

A more satisfactory method of analyses of insecticide should be worked out to prevent delays in operation and still ensure that the materials purchased meet all specifications.

GRASSHOPPER CONTROL - 1958



GRASSHOPPER

Region: **Southern**

Prepared by:

Period *(Designate: Month, 1-15, 16-31, or 1-31)*: **Fiscal Year 1958**

Date prepared:

COUNTY OR LOCATION A	STATUS First of Period B	INFESTED ACRES* State & Private C	INFESTED ACRES* Public Domain** D	INFESTED ACRES* Total Acreage E	ACRES SCHEDULED FOR TREATMENT F	ACREAGE TREATED State & Private G	ACREAGE TREATED Public Domain** H	ACREAGE TREATED Total Acres I	STATUS End of Period J
STATE									
Oklahoma	-	1,609,030	0	1,609,030	-	242,538	0	242,538	-
Texas	-	3,276,054	77,000	3,353,054	-	854,418	77,000	931,418	-
Total This Period	-	4,885,084	77,000	4,962,084	-	1,096,956	77,000	1,173,956	-
Total From July 1									

Note: Figures include some treatment applied during fiscal year 1959 but contracted during Fiscal Year 1958.

*Any minus figure must be explained.

**Identify ownership by Agency, i.e., BLM, Forest Service, etc.

PPC 7-6
(Feb.-58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

GRASSHOPPER CONTROL

* * *

PROGRESS ANNUAL REPORT

1968 FISCAL YEAR

* * *

IOWA STATE UNIVERSITY OF SCIENCE AND TECHNOLOGY
AGRICULTURAL EXPERIMENT STATION
PLANT PEST CONTROL DIVISION
AMES, IOWA 50010

GRASSHOPPER CONTROL

• • •

PROGRAM ANNUAL REPORT
1958 FISCAL YEAR

• • •

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

_____

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

GRASSHOPPER CONTROL

July 1, 1957 - June 30, 1958

Cooperating Agencies:

State Departments of
Agriculture, Counties, Local Agencies, Private
Individuals, and Other Federal Agencies
of the Eleven Western States

April 17, 1959
Oakland, California

Jim R. Dutton
Regional Supervisor

HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishment for the Fiscal Year

Farmers treated infested cropland, and in some cases protective border strips of rangeland, holding to a minimum crop losses due to grasshoppers. In some localized areas, principally in the State of Montana, voluntary treatment of rangeland was successfully carried out. Some control was done by the State and landowners who jointly financed work on both cropland and rangeland in portions of Colorado and Montana.

The program originally planned was expanded to include cooperative roadside spraying financed by State, County, and Division funds in Colorado and Wyoming.

Regular cooperative rangeland control work was conducted on 2,829,888 acres in nine western states.

Adult, egg, and nymphal surveys were made as usual, and technical assistance from Division personnel was available to landowners at all times.

Major Deviation from Work Plan

Two major deviations from work plans occurred. In Nevada, New Mexico, and primarily Arizona, in May 1958 there was an unexpected build-up of the desert locust, *Trimerotropis pallidipennis*, resulting in the necessity for treatment of small concentrated areas in southern Nevada and nearly 140,000 acres of rangeland in central Arizona.

In late May and June in Colorado, conditions favorable to survival of nymphs resulted in tremendous build-ups of grasshopper populations in large areas. Many such infestations were almost entirely *Melanoplus bilituratus*, with *Melanoplus bivittatus* and *Melanoplus packardi* as secondary species. Three different cooperative programs were conducted in Colorado throughout the summer. Nearly 800,000 acres of cropland were treated in the cooperative program financed jointly by the State and landowners. Over 162,000 acres were included in the cooperative roadside program and nearly 2,000,000 acres in the regular cooperative rangeland program in that State. Extensive fall baiting was done by farmers in order to protect new plantings of fall wheat.

Status of Program at Close of Year

By June 30, 1958, no control work had started in Wyoming or Utah. Some 400,000 acres were receiving strong consideration for treatment in Wyoming and 60,000 to 100,000 acres in Utah. The 1957 fall adult surveys indicated a need for this amount of work since they showed a total infestation of 703,200 acres in these two states.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

How planned and directed

Under the general direction of the Regional Office but operating within broad policy limit, State Supervisors have prime reponsibility for planning and directing individual control jobs. Planning and direction responsibilities are shared jointly between our State Supervisors and State cooperators. Early planning is based on the biological need coupled with early indications of desire on the part of landowners for a cooperative program. Final planning must wait for development of infestations plus a firming up of landowner participation.

Technical Assistance

Technical assistance provided to farmers and others by program personnel

Adult and nymphal surveys are among the more essential types of technical assistance provided to landowners and other cooperators. In addition to surveys, technical advice on control timing, methods, and evaluation of results are made available to farmers on cropland grasshopper problems. On rangeland where financial participation in cooperative control programs was possible, technical assistance by Division personnel was provided. Where cooperative programs did not develop, we still discharged the responsibility of keeping the situation under observation.

Technical assistance provided to program by cooperating agencies

Technical recommendations of States are conformed with as closely as possible by Division personnel working within a State.

The Entomology Research Division field laboratories at Bozeman, Montana and Tempe, Arizona were most cooperative in helping on matters concerning insecticides, residues, dosages, control methods, etc.

Survey

Procedures or techniques used

Adult surveys made during the fall of 1957 were based on a single revised rating table because the two-table system developed some erroneous pictures of situations where mixed crop and range infestations occurred. No other changes were made in survey procedures or techniques.

Accomplishments

A limited number of egg surveys were made in those areas where flights were suspected following the previously accomplished adult survey.

Nymphal surveys were made in all areas where control work was contemplated. The strongest emphasis was placed on the adult survey because it is possible to obtain at that time the clearest picture of the grasshopper situation and its potential. The following table entitled "1957 Adult Grasshopper Survey" and map entitled "Grasshopper Adult Survey - Fall 1957" are a record of survey work accomplished and data obtained.

Statement or table of crop losses

Crop losses due to grasshoppers appear in the table entitled "Voluntary and Cooperatively Financed Grasshopper Control, Estimates of Acres Protected, Loss in Dollars, and Savings in Dollars as Reported by States -- 1957 Growing Season."

Control

Procedures or Techniques Used

Voluntary control work on rangeland was accomplished by airplane or ground spray application of aldrin, dieldrin, or heptachlor. Voluntary cropland control work was done similarly but in some cases alternate

insecticides such as chlordane, toxaphene, or BHC were chosen by the owner. Some oil bait was used involving some one of these insecticides or sodium fulosilicate as the toxicant. Statistics depicting a record of this work appear in the table entitled "Voluntary Control -- Estimated Acreages of Land Treated and Insecticides Used, as Reported by States -- 1957 Growing Season."

Cooperative rangeland control programs again used contract aircraft applying one gallon per acre of oil solution containing either two ounces of aldrin or heptachlor.

Chlorinated hydrocarbon insecticides remain the most practical and effective materials for grasshopper control.

Accomplishments

All types of control accomplishments are depicted in table form and also on the control map in this report. The determination of actual accomplishments for the fiscal year was based on fiscal year funds. Only work financed from fiscal year 1958 funds is shown on the map or in the tables. The cooperative roadside work in Colorado and Wyoming appear under the "ground equipment" column in the table entitled "Cooperative Range Grasshopper Control Operations -- Acreages Sprayed and Costs."

Regulatory

Not applicable

Methods Improvement

In the field of methods improvement our objective is to put into wide field use cheaper and less dangerous insecticides as they are approved by research. We have a similar aim concerning improved application equipment.

During this fiscal year we broadened our use of mobile, portable, and stationary radios and found them increasingly helpful in all phases of control and survey activities. Sensitized cards were brought into widespread use this year by many of our field supervisors as a means of checking spray application by planes. Manpower limitations restricted their use, and therefore effectiveness, but nevertheless they were an important factor in checking aircraft accomplishment.

Our 1958 field season contract called for a government mixing station inspector to monitor the work of contractors in mixing field insecticides. This presented a manpower problem, but did assure contracting officers that the government was getting insecticides that met contract specifications.

Geodetic Survey topographical maps were not so generally used as we had expected. Pilots made more use of maps drawn on plain paper, showing nothing but section lines, treatment area boundaries, and significant landmarks which were inserted after making both ground and air observations.

Other

Cooperation received during fiscal year

As in the past, the States of Colorado and Wyoming did all contracting for cooperative rangeland work. This year Arizona also performed this activity. The State of Wyoming again supplied most of the seasonal working force, but their transportation was provided by the Division. The State of Colorado took the responsibility for organizing control areas and keeping records on control activities.

In eastern Colorado counties, the State Highway Department assumed the responsibility for carrying out the cooperative roadside program on all Federal-State highways. Twenty Division-owned Buffalo turbine sprayers and some state highway and county-owned equipment were used in this program.

Associated activities

Shown in table

RECOMMENDATIONS FOR COMING YEAR

Survey

We would like to see more cooperation on the part of some states in carrying out surveys and more responsibility taken by them in organizing control areas.

Control

The greatest weakness of this program continues to be the shortage of trained personnel. It is again urged that all supervisors make an effort to obtain the summertime services of reliable people, train them in this work, and keep them interested in returning anually.

Because of the lack of adequate records of daily activities of all kinds at airstrips, we recommend that a form be devised which will cover all items necessary for such a record. A two-page form is now being developed in this Region which will be submitted for consideration.

Methods Improvement

It is urged that more mobile and handi-talki radios be procured in an effort to eventually put enough on each control job to provide effective communications. We also recommend that the agricultural aviation industry again be urged to obtain an assigned frequency from FCC for its use. The concensus of supervisors in this Region is that it is advisable that airplane contractors, rather than insecticide contractors, furnish airplane loading equipment.

RANGELAND GRASSHOPPER CONTROL

LOCATION AND SIZE OF AREAS COOPERATIVELY TREATED FISCAL YEAR 1958

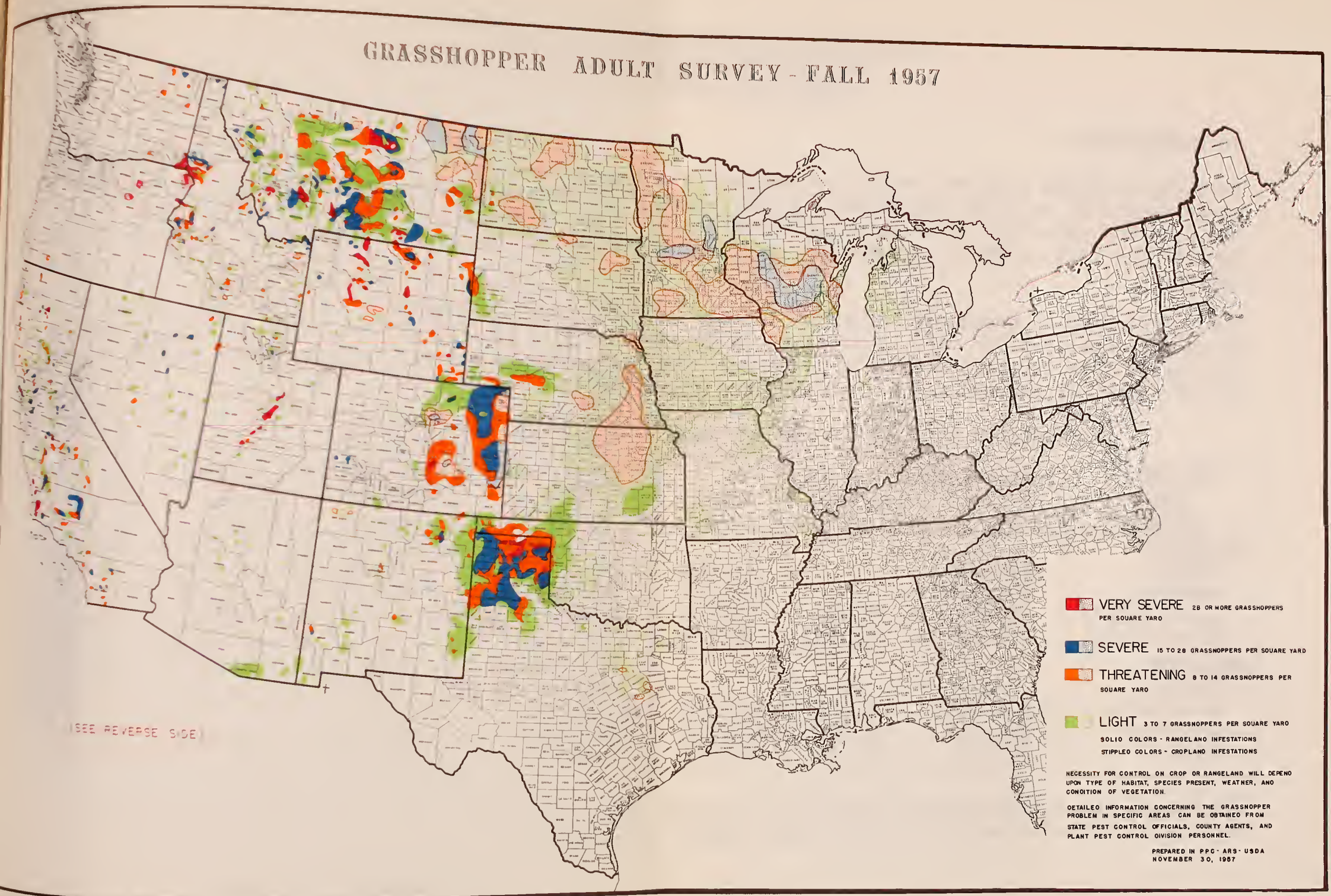
TREATED AREAS ARE SHOWN DIAGRAMATICALLY AND NOT TO SCALE BECAUSE OF SMALL NUMBER OF ACRES INVOLVED IN SOME COUNTIES. ACTUAL TREATED ACREAGES ARE SHOWN ON LEGENDS.

TOTAL ACRES TREATED 2,829,888

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION
OCTOBER 23, 1958

GPO 977337

GRASSHOPPER ADULT SURVEY - FALL 1957



GPO 850458

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

TO COOPERATORS:

This map is based upon the results of cooperative grasshopper adult surveys made during the late summer and fall of 1957. The survey reveals where and how many grasshoppers infest an area, and indicate the potential severity of infestations for 1958. Nymphal surveys, made each spring, provide the final index of grasshopper populations which will warrant control that growing season.

The infestation on croplands, shown on the map in stippling, in general is lighter than that which was indicated for 1957. Control on those lands will be handled by the farmers with technical assistance from Division and State personnel. The infested range areas, shown on the map in solid colors, total 18,686,492 acres in 17 Western and Midwestern States.

RANGELAND GRASSHOPPER INFESTATIONS - ACREAGE BY REGIONS - FALL 1957

REGION AND STATE	LANDOWNERSHIP - ACRES		Total Acres	REGION AND STATE	LANDOWNERSHIP - ACRES		Total Acres
	Private & State	Public Domain			Private & State	Public Domain	
CENTRAL:				Montana	3,020,000	1,891,000	4,911,000
Kansas	218,800	-	218,800	Nevada	18,800	63,700	82,500
Nebraska	355,000	-	355,000	New Mexico	431,300	41,000	472,300
North Dakota	1,000	17,560	18,560	Oregon	364,147	29,505	393,652
South Dakota	12,800	15,700	28,500	Utah	-	60,000	60,000
WESTERN:				Washington	250,280	75,720	326,000
Arizona	0	0	0	Wyoming	582,200	61,000	643,200
California	3,030,980	5,000	3,035,980	SOUTHERN:			
Colorado	1,389,000	40,000	1,429,000	Oklahoma	240,000	50,000	290,000
Idaho	203,280	246,720	450,000	Texas	5,972,000	-	5,972,000

The survey was planned and performed by the Plant Pest Control Division, Agricultural Research Service in cooperation with various state agencies concerned.

November 30, 1957

Grasshopper Control

WORK REPORT
1957 ADULT GRASSHOPPER SURVEY

State	No. of Counties Surveyed	Total No. of Stops	Miles Traveled on Survey	No. of Men		Man Days		Time Period	
				PPCD	State & Co.	PPCD	State & Co.	Start	Stop
Arizona	11	197	9,897	9	3	68.75	7	7-22-57	10-4-57
California	48	535	30,145	6	47	41	430.75	6-4-57	8-30-57
Colorado	38	323	9,923	6	0	81.25	0	8-12-57	10-1-57
Idaho	44	431	16,085	8	0	109	0	7-31-57	9-20-57
Montana	53	704	27,094	9	0	156	0	8-1-57	8-29-57
Nevada	14	178	6,000	1	1	30	22	8-8-57	9-15-57
New Mexico	31	563	15,884	9	0	80	0	7-22-57	9-17-57
Oregon	7	131	5,712	4	1	27	4	8-5-57	8-19-57
Utah	29	201	5,873	3	1	33	2	8-14-57	8-28-57
Washington	21	111	6,356	3	0	33	0	8-5-57	9-5-57
Wyoming	23	240	13,713	1	4	20	44	8-12-57	9-16-57
Total	319	3,614	146,682	59	57	679.00	509.75		

COOPERATIVE RANGELAND CONTROL ACCOMPLISHMENTS
DURING FISCAL YEAR 1958

Grasshopper Control

State	Private and State Lands (Acres)	Federal Lands (Acres)	Total Acreage
Arizona	138,450		138,450
California	1,440	3,696	5,136
Colorado	2,000,229	168,870	2,169,099
Idaho	56,292	33,611	89,903
Montana	147,431	84,808	232,239
Nevada	4,560	9,300	13,860
New Mexico	95,949	52,300	148,249
Utah	3,540	25,628	29,168
Wyoming	3,784		3,784
Totals	2,451,675	378,213	2,829,888

COOPERATIVE RANGELAND CONTROL
DEPARTMENT OF AGRICULTURE LANDS

Grasshopper Control

Fiscal Year 1958

STATE	AREA	Period of Control	Land Ownership (Acres) Forest Service
California	Hope Valley (Alpine County)	7/5-12, '57	2,592
Colorado	Baca County	6/29-7/20, '58	81,481
Idaho	Decker & Cape Horn Flats (Custer Co.)	7/20-22, '57	3,960
	Wilson & Greenfield Meadows (Gem-Valley Co.)	8/8-10, '57	9,595
	Targhee Nat'l. Forest (Lemhi Co.)	7/16-19, '57	11,000
	Lion Head Peak (Fremont Co.)	6/27-8/6, '58	1,230
Montana	Zortman (Phillips Co.)	7/29-8/4, '57	560
	Jackson (Beaverhead Co.)	7/17-29, '57	11,390
	Park Co.	7/27 , '57	200
New Mexico	Mansker (Union Co.)	6/28-7/13, '58	52,300
Utah	Manti-LaSal & Fishlake Nat'l Forest	8/9-12, '57	25,628
Total			199,936

COOPERATIVE RANGELAND CONTROL - WAR DEPARTMENT LANDS

STATE	AREA	Period of Control	Land Ownership (Acres)	
			Air Force	Corps of Engineers
Colorado	Buckley Field Bombing Range	7/15-25, '58	62,309	-
	Bent County (Dam Site)	7/5-20, '58		12,474
Total			62,309	12,474

COOPERATIVE RANGELAND CONTROL
DEPARTMENT OF INTERIOR LANDS

Grasshopper Control

Fiscal Year 1958

STATE	AREA	Period of Control	Land Ownership (Acres) Fish and Wildlife Service	BLM	Indian Service	Total Acres Treated
California	Tulelake Area(Siskiyou Co.)	7/30/57	1,104	-	-	1,104
Colorado	Fremont-Custer Counties	7/5-10,'58	-	3,110	-	3,110
	Jefferson County	7/10-15,'58	-	640	-	640
	Kiowa County	6/12-20,'58	-	8,816	-	8,816
	Yuma County	7/10-15,'58	-	40	-	40
Idaho	Decker & Cape Horn Flats (Custer Co.)	7/20-22,'57	-	500	-	500
	Adjacent Targhee Forest (Lemhi Co.)	7/16-19,'57	-	5,982	-	5,982
	Arco Pass (Butte County)	6/29-7/5,58	-	744	-	744
	Latah-Nez Perce Counties	6/27-7/17,58	-	-	600	600
Montana	Zortman (Phillips Co.)	7/29-8/4,'57	-	5,780	11,000	16,780
	Chouteau County	7/15, '57	-	3,440	-	3,440
	Bighorn County	6/16-22, '58	-	-	900	900
	Southeastern Phillips County	6/29-7/12,'58	34,600	16,938	-	51,538
Nevada	Elko County	7/1-31, '57	-	7,800	-	7,800
	Lincoln County	6/1-30, '58	-	1,500	-	1,500
Total			35,704	55,290	12,500	103,494

GRASSHOPPER
JUNE STATISTICAL REPORT
Including Cumulative Control Data for Fiscal Year 1958

Region: Western | Prepared by: WPPCR
Period (Designate: Month, 1-15, 16-31, or 1-31): June 1 - 30, 1958 (Final Report) | Date prepared: 10/20/58

COUNTY OR LOCATION A	STATUS First of Period B	INFESTED ACRES* State & Private C	Public Domain** D	Total Acreage E	ACRES SCHEDULED FOR TREATMENT F	ACREAGE TREATED State & Private G	Public Domain** H	Total Acres I	STATUS End of Period J
						(All Work Accomplished With FY 1958 Funds)			
California	3,116,030	3,111,030	5,000	3,116,030	0	0	0	0	3,116,030
Colorado	1,429,000	4,416,210	268,790	4,685,000	2,156,436	1,987,566*	168,870	2,156,436	2,528,564
Idaho	490,000	160,410	330,465	490,875	149,075	53,251	2,575	55,826	435,049
Montana	4,911,000	3,020,000	1,666,000	4,686,000	120,000	47,013	52,438	99,451	4,586,549
Nevada	82,500	35,800	361,700	397,500	19,300	310	5,000	5,310	392,190
New Mexico	472,300	431,300	89,300	520,600	148,249	95,949	52,300	148,249	371,851
Oregon	393,652	364,147	29,505	393,652	0	0	0	0	393,652
Utah	60,000	0	60,000	60,000	0	0	0	0	60,000
Washington	326,000	250,280	75,720	326,000	0	0	0	0	326,000
Wyoming	709,180	584,900	124,280	709,180	200,000	3,784	0	3,874	705,396
Total This Period	11,989,662	12,374,077	3,010,760	15,384,837	2,793,060	2,187,873	281,183	2,469,056	12,915,281
Total From July 1						2,451,674	378,214	2,829,888	

*Includes 162,274 acres of roadside work.

*Any minus figure must be explained.
**Identify ownership by Agency, i.e., BLM, Forest Service, etc.

PPC 7-6
(Feb.-58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Grasshopper Control

SUMMARY OF ASSOCIATED ACTIVITIES

Fiscal Year 1958

State	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.*	Infest. Maps & Posters	
Arizona	6	6										
California	15	15		3			25		5,000		250	4
Colorado	31	20	1	5	15	10	75	1	250	250	100	1
Idaho	8	7			1				50		60	
Montana	11	11										
Nevada	15	2					4		40	50	22	8
New Mexico	9	9						100			100	
Oregon									250		25	
Utah	15	10	3	20	12		35		140	1,100	55	33
Washington				1					200		25	
Wyoming	4	3									100	
Total	114	83	4	29	28	10	139	101	5,930	1,400	737	46

*Written by Federal personnel for release direct or through cooperators.

COOPERATIVE RANGE GRASSHOPPER CONTROL OPERATIONS
ACREAGES SPRAYED AND COSTS

Grasshopper Control

Fiscal Year 1958

State & Location	Period of Control Operations	Acreage Treated			Costs (Dollars)				
		Contract Aircraft	Ground Equipment	Total Treated	States, Counties, & Landowners	Other Co-operating Agencies	Plant Pest Control Division	Total Cost	Average Cost Per Acre
Arizona									
Pinal-Maricopa Pima	5/5-12,58	138,450	-	138,450	$44,837.92	-	$22,418.96	$ 67,256.88	$0.48578
Total		138,450		138,450	44,837.92		22,418.96	67,256.88	0.48578
California									
Hope Valley Area (Alpine Co.)	7/5-12,57	-	2,592	2,592	927.77	-	824.76	1,752.53	0.6761
Tulelake Area (Siskiyou Co.)	7/30,57	1,104	-	1,104	-	$57.50	1,198.75	1,256.25	1.1379
Wheeler Ridge Demonstration (Kern Co.)	4/25-30,58	1,440	-	1,440	-	-	1,274.00	1,274.00	0.8847
Total		2,544	2,592	5,136	$927.77	$57.50	$3,297.51	$4,282.78	$0.8338
Colorado									
Adams	6/11-7/26,58	-	12,000	12,000					
Arapahoe	6/11-7/26,58	62,309	5,136	67,445					
Baca	6/11-7/26,58	169,702	8,000	177,702					
Bent	6/11-7/26,58	169,340	3,440	172,780					
Boulder	6/11-7/26,58	13,144	-	13,144					
Cheyenne	6/11-7/26,58	269,320	8,320	277,640					
Custer	6/11-7/26,58	10,000	-	10,000					

(Continued)

COOPERATIVE RANGE GRASSHOPPER CONTROL OPERATIONS--ACREAGES SPRAYED AND COSTS (Continued)

Fiscal Year 1958

State & Location	Period of Control Operations	Acreage Treated			Costs (Dollars)				
		Contract Aircraft	Ground Equipment	Total Treated	States, Counties, & Landowners	Other Co-operating Agencies	Plant Pest Control Division	Total Cost	Average Cost Per Acre
Colorado									
Douglas	6/11-7/26,58	58,346	4,632	62,978					
Elbert	6/11-7/26,58	-	4,964	4,964					
El Paso	6/11-7/26,58	-	4,120	4,120					
Fremont	6/11-7/26,58	34,955		34,955					
Jefferson	6/11-7/26,58	27,076	4,450	31,526					
Kiowa	6/11-7/26,58	166,358	3,000	169,358					
Kit Carson	6/11-7/26,58	-	13,600	13,600					
Lincoln	6/11-7/26,58	-	6,584	6,584					
Logan	8/2-7, 57	12,663	-	12,663	$ 5,623.01		$ 2,811.51	$ 8,434.52	$0.666076
Logan	6/11-7/26,58	222,053	-	222,053					
Morgan	6/11-7/26,58	-	12,049	12,049					
Prowers	6/11-7/26,58	440,881	10,000	450,881					
Pueblo-Huerfano	6/11-7/26,58	132,292	2,992	135,284					
Sedgwick	6/11-7/26,58	109,209	3,464	112,673					
Yuma-Phillips	6/11-7/26,58	109,137	18,200	127,337					
State Highways	6/11-7/26,58	-	37,323	37,323					
Cal. Yr. 57 Total		12,663	-	12,663	$5,623.01	-	$2,811.51	$ 8,434.52	$0.666076
Cal. Yr. 58 Total		1,994,122	162,274	2,156,396	$612,789.66	-	$401,224.85	$1,014,014.51	$0.4702
FY 58 Total		2,006,785	162,274	2,169,059	$618,412.67	-	$404,036.36	$1,022,449.03	$0.4713

(Continued)

COOPERATIVE RANGE GRASSHOPPER CONTROL OPERATIONS--ACREAGES SPRAYED AND COSTS (Continued)

Fiscal Year 1958

State & Location	Period of Control Operations	Acreage Treated			Costs (Dollars)				
		Contract Aircraft	Ground Equipment	Total Treated	States, Counties, & Landowners	Other Co-operating Agencies	Plant Pest Control Division	Total Cost	Average Cost Per Acre
Idaho									
Custer	7/20-22,57	4,960		4,960	$ 650.00	-	$ 2,846.80	$ 3,496.80	$0.7050
Lemhi	7/16-19,57	19,522		19,522	2,198.80		10,014.57	12,213.37	0.6256
Gem-Valley	8/8-10,57	9,595		9,595	1,187.50		4,781.43	5,968.93	9.6220
Butte	6/29-7/5,58	875		875	200.00		366.16	566.16	0.6470
Latah-Nez Perce	6/27-7/17,58	53,481		53,481	23,275.50		11,977.31	35,252.81	0.6591
Fremont	6/27-8/6,58	1,470		1,470	402.11		1,023.11	1,425.22	0.9695
Total		89,903		89,903	$27,913.91		$31,009.38	$58,923.29	$0.6554
Montana									
Phillips	7/29-8/4,57	63,390		63,390	17,618.94		13,156.07	30,775.01	0.48548
Park	7/27, 57	200		200	-		231.99	231.99	1.16
Chouteau	7/15, 57	3,440		3,440	448.00		1,718.51	2,166.51	0.6298
Beaverhead	7/17-29,57	65,758		65,758	19,275.48		16,899.66	36,175.14	0.55012
Bighorn	6/16-22,58		900	900			416.75	416.75	.463
Phillips	6/29-7/12,58	64,902		64,902	7,728.89		26,734.07	34,462.96	0.531
Stillwater-Sweetgrass	6/29-30, 58	33,649		33,649	11,413.18		5,706.54	17,119.72	0.50877
Total		231,339	900	232,239	$56,484.49		$64,863.59	$121,348.08	$0.5225

(Continued)

COOPERATIVE RANGE GRASSHOPPER CONTROL OPERATIONS--ACREAGES SPRAYED AND COSTS (Continued)

Fiscal Year 1958

State & Location	Period of Control Operations	Acreage Treated			Costs (Dollars)				
		Contract Aircraft	Ground Equipment	Total Treated	States, Counties, & Landowners	Other Co-operating Agencies	Plant Pest Control Division	Total Cost	Average Cost Per Acre
Nevada									
Elko	7/1-31,57	-	12,360	12,360	$ 3,249.00	-	$ 5,208.72	$ 8,457.72	$0.6840
Lincoln	6/1-30,58		1,500	1,500	633.50		1,267.00	1,900.50	1.2670
Total		-	13,860	13,860	$ 3,882.50	-	$ 6,475.72	$10,358.22	$0.74735
New Mexico									
Union	6/28-7/13,58	148,249	-	148,249	29,697.41		39,104.95	68,802.36	0.4641
Total		148,249		148,249	$29,697.41	-	$39,104.95	$68,802.36	$0.4641
Utah									
Sanpete-Sevier-Beaver	8/9-12,57	29,168	-	29,168	1,425.72		15,646.94	17,072.66	0.5853
Total		29,168		29,168	$1,425.72	-	$15,646.94	$17,072.66	$0.5853
Wyoming									
Goshen	6/18-30,58	-	3,784	3,784	1,476.87		716.36	2,193.23	$0.5796
Total		-	3,784	3,784	$1,476.87	-	$716.36	$2,193.23	$0.5796
Grand Total		2,646,438	183,410	2,829,848	$785,059.26	$57.50	$587,569.77	$1,372,686.53	$0.48507

VOLUNTARY AND COOPERATIVELY FINANCED GRASSHOPPER CONTROL,
ESTIMATES OF ACRES PROTECTED, LOSS IN DOLLARS, AND SAVINGS IN DOLLARS
AS REPORTED BY STATES
1957 GROWING SEASON

Grasshopper Control

State	VOLUNTARY CONTROL			COOPERATIVELY FINANCED CONTROL		
	Protected (Acres)	Loss Caused (Dollars)	Savings From Control (Dollars)	Protected (Acres)	Loss Caused (Dollars)	Savings From Control (Dollars)
Arizona	*	*	*	350,000	*	*
California	1,389,231	1,656,639	36,669,767	7,000	5,000	12,000
Colorado	850,000	3,250,000	5,000,000	19,560	98,000	60,000
Idaho	24,400	78,250	59,800	54,000	160,000	29,500
Montana	814,000	1,170,000	4,165,000	654,843	495,000	820,400
Nevada	10,000	15,000	50,000	67,000	10,000	100,000
New Mexico	15,000	140,000	160,000	300,000	75,000	225,000
Oregon	6,962	110,000	71,500	0	*	0
Utah	320,240	355,420	225,150	110,000	215,000	120,700
Washington	1,758	4,600	1,800	0	*	0
Wyoming	11,100	10,000	16,650	442,889	400,000	663,774
Total	3,442,691	6,789,909	46,419,667	2,005,292	1,458,000	2,031,374

* Reports Incomplete

COOPERATIVE AID RECEIVED

Grasshopper Control

Fiscal Year 1958

	1	2	3	4	5	6	7	8
State and Source of Aid	Cash and Equivalent Aid*				Total of Cash & Equivalent	Intangible Service Estimate**	Source Grand Total	Remarks
	Cash	Personal Services	Equipment & Supplies	Space				
State Depts. of Agric.	$	$	$	$	$	$	$	
Arizona	22,418.96	2,547.00			24,965.96	2,500.00	27,465.96	
California		10,550.00			10,550.00	-	10,550.00	
Colorado	334,131.31	9,069.61			343,200.92	11,000.00	354,200.92	
Idaho	14,046.24	150.00			14,196.24	-	14,196.24	
Nevada		6,830.00	1,875.00	600.00	9,305.00	-	9,305.00	
New Mexico	14,848.70	725.00			15,573.70	3,000.00	18,573.70	
Utah		285.00			285.00	-	285.00	
Washington					-	250.00	250.00	
Wyoming	870.78	4,850.00			5,720.78	1,240.00	6,960.78	
Counties								
California					-	49,000.00	49,000.00	
Colorado	8,094.00	8,000.00			16,094.00	23,000.00	39,094.00	
Idaho	3,802.75				3,802.75	450.00	4,252.75	
Montana					-	1,500.00	1,500.00	
Wyoming		300.00	375.97		675.97	2,500.00	3,175.97	
Ranchers								
Arizona	22,418.96				22,418.96	-	22,418.96	
Colorado	275,177.11	4,530.54			279,707.65	2,600.00	282,307.65	
Idaho	10,065.03				10,065.03	-	10,065.03	
Montana	54,704.47				54,704.47	-	54,704.47	
Nevada		950.00	1,050.00		2,000.00	-	2,000.00	
New Mexico	14,848.71				14,848.71	800.00	15,648.71	
Oregon					--	400.00	400.00	
Utah	582.40				582.40	320.00	902.40	
Washington					--	200.00	200.00	

COOPERATIVE AID RECEIVED (Continued)

Grasshopper Control

Fiscal Year 1958

State and Source of Aid	1 Cash and Equivalent Aid* Cash	2 Personal Services	3 Equipment & Supplies	4 Space	5 Total of Cash & Equivalent	6 Intangible Service Estimate**	7 Source Grand Total	8 Remarks
Extension Service	$	$	$	$	$	$	$	
Colorado					-	6,700.00	6,700.00	
Idaho						750.00	750.00	
Montana					-	500.00	500.00	
New Mexico						400.00	400.00	
Oregon					-	2,400.00	2,400.00	
Washington					-	1,750.00	1,750.00	
Wyoming					-	1,200.00	1,200.00	
Experiment Sta.								
Colorado					-	3,500.00	3,500.00	
Montana						15,000.00	15,000.00	
State Colleges								
California		1,000.00			1,000.00	-	1,000.00	
Washington						150.00	150.00	
USDA-Forest Serv.								
Colorado						1,600.00	1,600.00	
Idaho					-	300.00	300.00	
Montana					-	250.00	250.00	
Nevada					-	200.00	200.00	
New Mexico					-	100.00	100.00	
Oregon					-	1,000.00	1,000.00	
Utah		170.00			170.00	560.00	730.00	
Washington					-	100.00	100.00	
USDA--SCS								
Colorado					-	1,000.00	1,000.00	
U.S. Indian Serv.								
Montana					-	250.00	250.00	-

COOPERATIVE AID RECEIVED (Continued)

Grasshopper Control

Fiscal Year 1958

	1	2	3	4	5	6	7	8
State and Source of Aid	Cash and Equivalent Aid*				Total of Cash & Equivalent	Intangible Service Estimate**	Source Grand Total	Remarks
	Cash	Personal Services	Equipment & Supplies	Space				
USDI-BLM	$	$	$	$	$	$	$	
Nevada		200.00	200.00		400.00	-	400.00	
Oregon					-	500.00	500.00	
Washington					-	100.00	100.00	
Other Fed. Agcys.								
Wyoming						1,300.00	1,300.00	
Indian Councils								
Montana	1,780.02				1,780.02	-	1,780.02	
Associations - Livestock								
Utah	923.32				923.32	-	923.32	
Total	$778,712.76	$50,157.15	$3,500.97	$600.00	$832,970.88	$138,370.00	$971,340.88	

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available.

EXPENDITURES BY SOURCE AND BY ACTIVITY

Grasshopper Control

Fiscal Year 1958

Source of Cash & Equivalent*	1 Planning & Direction	2 Technical Assistance	3 Survey	4 Control	5 Regulatory	6 Methods Improvement	7 Other	8 Total
Plant Pest Control Division	$141,740.29	$91,657.80	$105,997.85	$616,340.12		$5,155.00	$2,825.05	$963,716.11
Other Organizations (Name)								
States	12,820.00	6,592.00	8,695.00	395,290.60		200.00	200.00	423,797.60
Counties	3,000.00	1,000.00	1,000.00	15,572.72				20,572.72
Ranchers				384,327.22				384,327.22
Forest Service (Utah)	170.00							170.00
USDI(BLM) Nev.			200.00	100.00			100.00	400.00
Univ. of Calif.						1,000.00		1,000.00
Indian Councils				1,780.02				1,780.02
Utah Woolgrowers	80.00			754.80				834.80
Utah Cattle Ass'n.				88.52				88.52
Subtotal-Other Organizations	16,070.00	7,592.00	9,895.00	797,913.88		1,200.00	300.00	832,970.88
Total (of PPC & Other)	$157,810.29	$99,249.80	$115,892.85	$1,414,254.00	-	$6,355.00	$3,125.05	$1,796,686.99

(Continued)

EXPENDITURES BY SOURCE AND BY ACTIVITY (Continued)

Grasshopper Control

Fiscal Year 1958

Source of Cash & Equivalent*	1 Planning & Direction	2 Technical Assistance	3 Survey	4 Control	5 Regulatory	6 Methods Improvement	7 Other	8 Total
Contributed Services**								
Depts. of Agric.	$ 8,750.00	$ 3,700.00	$ 3,450.00	$ 1,500.00	$100.00	$ 200.00	$ 290.00	$ 17,990.00
State Exp. Sta.	500.00	1,000.00				17,000.00		18,500.00
Extension Service	2,650.00	3,300.00	5,000.00	2,250.00	200.00	300.00	150.00	13,850.00
Counties	13,500.00	12,500.00	15,000.00	32,350.00			3,100.00	76,450.00
Ranchers	800.00		2,920.00	500.00			100.00	4,320.00
Other Fed. Agencies	1,050.00	100.00	4,230.00	1,580.00			300.00	7,260.00
Total	27,250.00	20,600.00	30,600.00	38,180.00	300.00	17,500.00	3,940.00	138,370.00
Grand Total	$185,060.29	$119,849.80	$146,492.85	$1,452,434.00	$300.00	$23,855.00	$7,065.05	$1,935,056.99

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

GPO 978214

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
CENTRAL REGION

ANNUAL PROGRAM REPORT

GYPSY MOTH

July 1, 1957 - June 30, 1958

In Cooperation with Other
Federal, State, County and Local Agencies

November 14, 1958
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

TABLE OF CONTENTS

I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITIES

A. Accomplishment for the fiscal year

In recent years Michigan is the only state in the Central Region that has had a gypsy-moth problem. No control was done in this State during the 1958 fiscal year as scouting and trapping the previous summer and fall failed to locate any gypsy moths. The most recent control operations were conducted during the period May 5-23, 1957, and involved some 18,880 acres in the counties of Eaton, Clinton, and Shiawassee. During the 1957 season, 4,911 traps were placed in parts of Barry, Calhoun, Clinton, Eaton, Gratiot, Ionia, Jackson, Livingston, Saginaw, Shiawassee, and Washtenaw Counties. No moths were caught during the entire fiscal year 1958.

In Indiana trapping was conducted by a State employee during July and August, 1957. Forty traps were placed in eight counties. The areas checked were State parks in seven counties, which campers and tourists frequent, and the eighth county included a lumber mill which receives logs from eastern states. No moths were captured in Indiana.

B. Major deviation from work plan

No changes

C. Status of program at close of year

At the close of the fiscal year, June 30, 1958, trapping was under way. Traps placed in Michigan during the season were as follows:

Counties	No. Townships	No. of Traps
Calhoun	1	12
Clinton	12	711
Eaton	16	1,330
Ingham	16	1,421
Ionia	4	112
Jackson	5	89
Shiawassee	8	279
Total		3,954

II. PROGRAM ACTIVITY DURING FISCAL YEAR

A. Planning and direction

The program is the joint responsibility of the Plant Pest Control Division and the Michigan State Department of Agriculture. In Indiana the non-Federal cooperator is the State Department of Conservation.

B. Technical assistance

Technical assistance was provided by the Plant Industry Division of the State Department of Agriculture and Michigan State University, with whom the Division cooperates. Division personnel released appropriate survey information. All control work is the joint responsibility of the Division and cooperating State Department.

C. Survey

The trapping pattern in Michigan includes the setting on the average of $2\frac{1}{2}$ traps per square mile throughout the areas under observation. Traps are usually set during early June and pulled in early September, depending upon weather conditions. Some visual scouting for egg masses or clusters is also done in the fall after the host trees have lost their leaves.

During the summer of 1957, trapping involved the setting of 4,911 traps covering 1,977 square miles. For the 1958 season, 3954 traps were used to cover 1,499 square miles.

D. Eradication or control

No control work was performed during the 1958 fiscal year.

E. Regulatory

A regulatory enforcement program is not involved except for the inspection work done in Michigan by State inspectors, who check for gypsy moth while contacting nurserymen and dealers throughout the State in connection with their regular nursery-inspection work Division and cooperating State personnel make certain that all Christmas trees moving into the Central Region from eastern regulated areas have been properly inspected and certified at the points of origin.

F. Methods improvement

Methods now employed under the survey program and also under the control efforts appear to be adequate. The most important part of trapping, aside from proper placement of the trap, is adequate and active supervision of the trap tenders.

G. Other

Mr. Turner's comment concerning future gypsy-moth program work in Michigan is quoted below:

> "We feel it is likely that we will catch a few male moths before the trapping season is over since we are working in the heart of the previously known infestation."

III. RECOMMENDATIONS FOR COMING YEAR

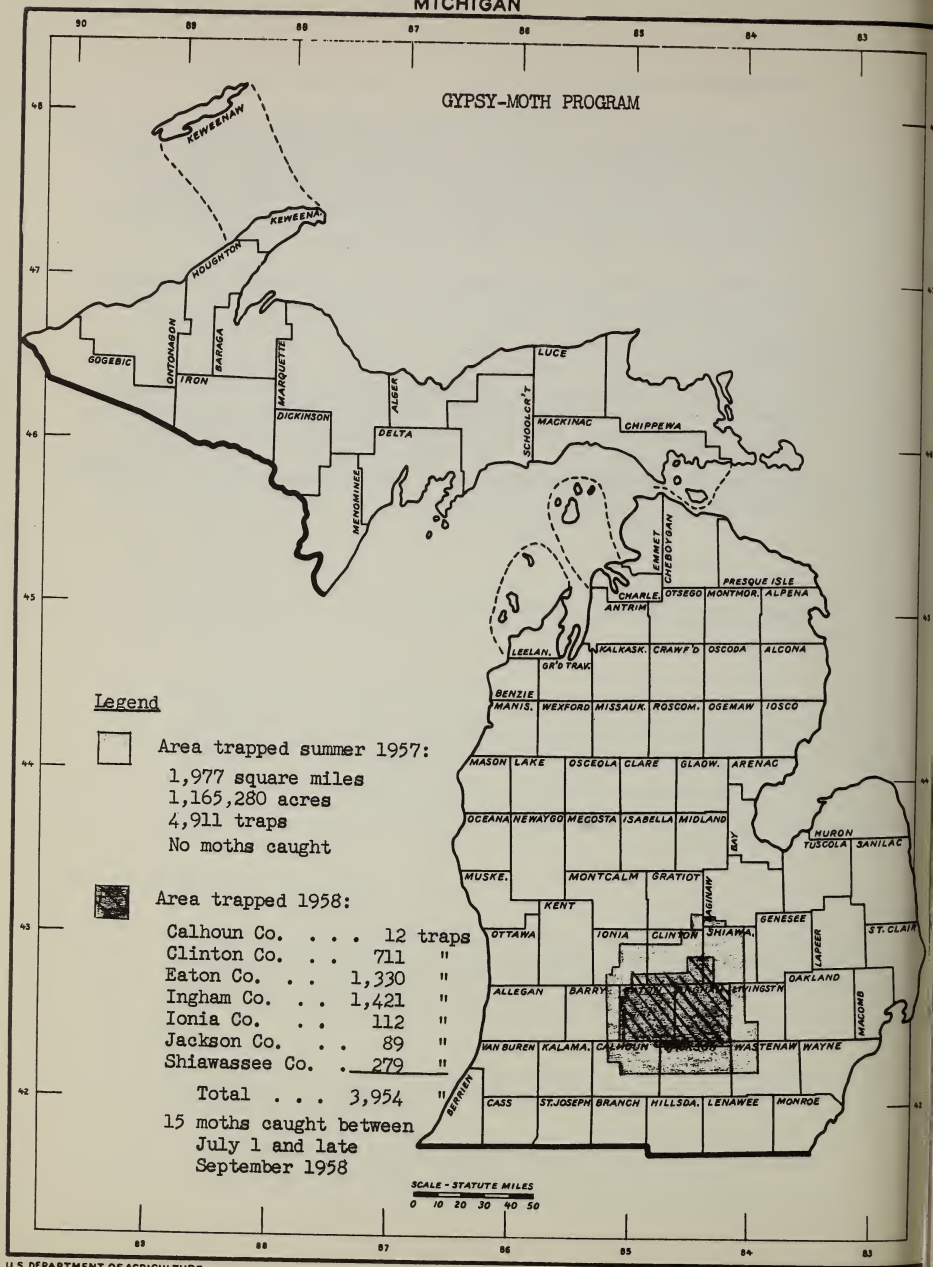
The recommendation for the 1959 season is to trap 1,500 square miles in the following seven counties: Calhoun, Clinton, Eaton, Ingham, Jackson, Livingston, and Shiawassee. This will include all previously known infestations around Lansing, Michigan. It should start in June 1959 and the pattern of $2\frac{1}{2}$ traps per section will be continued, with some 4,000 traps being placed.

The chief objective of the gypsy-moth work in Michigan is the complete eradication of this pest from the State.

Note:

As a result of the trapping during the 1958 season, it is anticipated that some 20,000 acres will require treatment by aircraft in 1959. Between July 1, 1958, and early September, 15 moths were trapped in Clinton, Eaton, and Ingham Counties. Two of these areas are initial infestations, the third being located within a previously treated control area.

MICHIGAN



Legend

Area trapped summer 1957:

1,977 square miles
1,165,280 acres
4,911 traps
No moths caught

Area trapped 1958:

Calhoun Co. . . .	12	traps
Clinton Co. . .	711	"
Eaton Co. . .	1,330	"
Ingham Co. . .	1,421	"
Ionia Co. . .	112	"
Jackson Co. . .	89	"
Shiawassee Co. .	279	"
Total . . .	3,954	"

15 moths caught between July 1 and late September 1958

Gypsy Moth - Accomplishments, Fiscal Year 1958

State	Outside Regulated Area: Number of: Traps in Use	Outside Regulated Area: Number of: Traps Catching	Outside Regulated Area: Number of: Moths Trapped	Outside Regulated Area: Infestations Located by Finding Eggs or Larvae Only	Inside Regulated Area: Number of: Traps in Use	Inside Regulated Area: Number of: Traps Catching	Inside Regulated Area: Number of: Moths Trapped	Inside Regulated Area: Infestations Located by Finding Eggs or Larvae Only	Acres Defoliated by Gypsy Moth
Michigan	5,690*								
Total	5,690								

*Includes total for the season.

Gypsy Moth - Summary of Associated Activities - Fiscal Year 1958

State	Public Meetings Attended	Presentations: Talks	Presentations: Slides	Presentations: Films	Presentations: Radio	Presentations: TV	Feature Stories & News	Extent These Aids Were Used**: Exhibits	Extent These Aids Were Used**: Bulletins*	Extent These Aids Were Used**: Circulars*	Extent These Aids Were Used**: Infest. Maps & Posters	Other
FEDERAL												
Michigan	-	1	1	2	-	-	-	-	340	640	-	-
Ohio	-	1	-	-	-	-	-	-	-	-	-	-
Subtotals	-	2	1	2	-	-	-	-	340	640	-	-
COOPERATORS												
Michigan	-	6	-	2	1	1	-	-	-	-	-	-
Subtotals	-	6	-	2	1	1	-	-	-	-	-	-
GRAND TOTALS	-	8	1	4	1	1	-	-	340	640	-	-

*Written by Federal personnel for release direct or through cooperators.
**Conservative estimate.

Gypsy Moth - Cooperative Aid Received - Fiscal Year 1958

State	Cash and Equivalent Aid*				Total of Cash & Equiv.	Intangible Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Indiana	505	0	0	0	505	50	555
Michigan	28,650	0	148	0	28,798	4,000	32,798
Totals	$29,155	$ 0	$148	$ 0	$29,303	$4,050	$33,353

*Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available.

Gypsy Moth - Expenditure by Source and by Activity - Fiscal Year 1958

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
CASH & EQUIVALENT								
Plant Pest Control Division	$4,000	$1,000	$22,460	0	$1,000	0	0	$28,460
Other Organizations:								
Indiana	0	0	505	0	0	0	0	505
Michigan	4,000	100	24,550	0	0	0	148	28,798
Subtotals	$4,000	$ 100	$25,055	0	0	0	$ 148	$29,303
CONTRIBUTED SERVICES**								
Indiana	0	0	50	0	0	0	0	50
Michigan	0	0	2,000	0	2,000	0	0	4,000
Subtotals	0	0	$ 2,050	0	$2,000	0	0	$ 4,050
GRAND TOTALS	$8,000	$1,100	$49,565	0	$3,000	0	$148	$61,813

*Limited to direct appropriation, allotments from other sources, services, and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available.

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

GYPSY MOTH

July 1, 1957 - June 30, 1958

COOPERATING AGENCIES:

State Departments of Agriculture
Conservation and Forest Service
Experimental Stations, Extension Service
Plant Pest Control Division, Entomology Research Division
and
Northeast Forest Experiment Station, U. S. Forest Service
of the
United States Department of Agriculture

November 1958
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

TABLE OF CONTENTS

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

Early in July 1957, an isolated infestation was found on Yeager Mountain, near White Hall, Pennsylvania. An intensified trapping program disclosed that over 400,000 acres in parts of six counties were involved. A cooperative State-Federal eradication program undertaken in the Spring of 1958 covered 493,200 acres - the delimited infested lands and sizeable marginal areas. DDT at the one pound per acre rate was used. Sensitive sites were treated with smaller aircraft without incident or complaint. Subsequent trapping failed to reveal moth survival.

The court case, involving action brought by a group of Long Island residents seeking a permanent injunction against program spraying operations, was heard in Federal Court, Brooklyn, New York between February 10 and March 5, 1958. A decision rendered by the Hon. D. J. Bruchhausen, U. S. District Judge, on June 23, 1958, held that mass spraying has a reasonable relation to the public objective of combatting the gypsy moth and is within the proper exercise of police power by designated officials. Hence, the plaintiff's petition was denied.

Although difficulties were encountered in locating suitable pupal collection sites at home and abroad during the Summer of 1957, material vital to the trapping program was obtained on Cape Cod and in Connecticut. A total of 411,200 abdominal tips obtained from 589,855 female pupae resulted in a percentage recovery of 69.7 - the highest ever recorded.

In the Spring of 1958 a Division representative was sent to Europe to conduct a pupal collection program in Spain and to investigate insecticides that might be available for use against the gypsy moth. Research workers and insecticide manufacturers in England, Germany and Switzerland were contacted.

Division methods improvement activities were stepped up appreciably during the fiscal year in an endeavor to find a substitute for DDT that would facilitate continuation of eradication endeavors in dairy areas. This need developed as a result of reported residue findings in milk and on forage in New York State. Although this problem was traceable mostly to residues on sweet corn and forage treated for other purposes, the seriousness of the situation resulted in a decision by the State of New York to suspend gypsy moth eradication spraying with DDT in that State during 1958.

Trapping activities were expanded during the Summer of 1957. Over

25,000 traps were employed to survey approximately 15 million acres, including all areas sprayed for eradication in 1956 and 1957. Traps were loaned to the Dominion of Canada again this year.

Regulatory activities were continued with additional stress on movement of native plant material. Informational activities were expanded within and outside regulated areas to inform the public of quarantine requirements. Additional protests were submitted to Canada in relation to their lack of recognition of Quarantine No. 45 certification exemptions and their insistence on certification of host materials originating in non-regulated parts of New York, Vermont, New Hampshire and Maine.

B. Major Deviation from Work Plan

Plans for continuation of the progressive eradication program in New York during 1958 were suspended pending development of efforts to obtain an alternate insecticide more suitable than DDT on pasture and forage crops.

Discovery of the Yeager Mountain infestation in Pennsylvania necessitated an immediate adjustment and enlargement in the 1957 trapping program.

C. Status of Program at Close of Year

At the close of the year there was no known gypsy moth infestation in New Jersey and Pennsylvania, or in non-regulated and sprayed areas in New York. A total of 4,096,460 acres have been sprayed to eradicate the moth in isolated and peripheral areas of infestation in New Jersey, Pennsylvania and New York.

Scouting surveys throughout the generally infested area show unusually low moth populations in most sections, and aerial surveys conducted during the Summer of 1957 revealed only 6,458 acres of defoliation. However, there were indications in some sections that populations are again on the up-swing, particularly in the central and northwestern sections of Connecticut. This low ebb of infestation is attributed to natural enemies, severe winter temperatures, late frosts and spraying operations.

II. Program Activity During Fiscal Year

A. Planning and Direction

General planning and direction of the program was accomplished by the Regional Staff and Plant Pest Control Supervisors, in consultation with State Cooperators. Policy matters were discussed at the Division level. Research associates participated in planning methods

improvement, developmental and research activities.

B. Technical Assistance

1. Provided by program people

Program personnel furnished technical information and assistance to cooperating State and local agencies, and to growers, shippers and industries concerned with quarantine requirements. Following the 1957 spray program, a number of claims were filed against two of the spray contractors. Most of the claims were against the Lebonair Company which carried full liability insurance with Lloyds of London. Considerable time was devoted by supervisory personnel during the Summer and Fall of 1957 working with insurance company representatives and claim adjusters in connection with efforts to arrive at settlements.

2. Received by Program

In Pennsylvania, officials of the State Sanitary Engineers, the Board of Health, the Fish and Game organization, County Agents, and local officials cooperated in the program and provided valuable information regarding application of insecticide near reservoirs, lakes, and residential areas.

State and Federal research units and representatives of industry participated in cooperative studies and tests to develop and improve methods and procedures applicable to control, survey and regulatory activities. Major emphasis was in connection with problems associated with the eradication program and the development of a synthetic trap lure.

C. Survey

1. Procedures and Techniques Used

Three types of survey were employed, namely, trapping, scouting, and aerial defoliation. Sex-attractant traps are now used extensively in survey operations for determining distribution of the moth, delimiting infestations, and checking effectiveness of spray operations. Several methods of trap placement are utilized.

Intensive scouting is now limited principally to the scouting of isolated positive trap sites in peripheral and sprayed areas to confirm infestation, and in some cases, to determine treatment needs. Considerable scouting is also done within the area of general infestation by state cooperators to determine moth population trends on which to base control measures and prevent defoliation.

Aerial observations are made annually to detect prevalence, severity and extent of defoliation. This survey also provides pertinent information on population trends and control needs.

2. Accomplishments

In New York, 18,185 traps were employed to survey approximately 8½ million acres in all or parts of 35 counties. Approximately one-third of the traps were used within the regulated area, the balance outside. Traps were systematically placed throughout the 1956 sprayed area and the area sprayed on Long Island in 1957. In other sections of the 1957 sprayed area, traps were placed only at selected locations either to check on possible spray misses or in the vicinity of reservoirs and orchards necessarily omitted from the spray program. A large area in central New York adjoining the quarantine line on the west (systematically trapped the preceding year) was systematically retrapped, plus adjoining areas to the west and north. Farther to the west, 9 additional counties in the Finger Lakes region were surveyed by placing traps along highways. Delaware County, southernmost Westchester and the New York City Boroughs were trapped, as were also the northern sections of Clinton and Franklin Counties adjoining Canada.

No moths were recovered outside the regulated area, nor within the 1956 sprayed area. In all, a total of 109 traps captured 227 male moths, as follows: within the area sprayed on Long Island, 31 traps attracted 38 moths in six towns; within the area sprayed east of the Hudson River, six traps attracted single moths at sites bordering reservoirs and lakes where spray was not applied. In Delaware County, 28 traps caught 121 moths in nine towns in the eastern half of the county (unsprayed section). In Clinton County within the generally infested area, 44 traps caught 62 male moths in seven towns. Interim scouting throughout the fall and winter around positive trap sites on Long Island disclosed no living gypsy moth infestation. However, as a result of scouting conducted at and around nurseries for regulatory purposes, two single egg cluster infestations were found on Long Island, one in Huntington Township in Suffolk County within the 1957 sprayed area, and one in Hempstead Township, Nassau County, outside the sprayed area. Scouting at positive trap sites within the sprayed area east of the Hudson River was negative. In the unsprayed eastern section of Delaware County, 28 traps attracted a total of 121 moths in nine towns. In northern Clinton County scouting around positive trap sites revealed scattered light infestation.

In Pennsylvania, original trapping plans proposed placement of 3,277 traps in grid and modified grid pattern, in all or parts of eight northeastern counties, including all 1956 and 1957 sprayed areas.

During the placement of these traps an infestation on Yeager Mountain, near White Haven In Dennison Township, Luzerne County, was reported and confirmed. This was located outside the planned trapping area and necessitated revision of trapping plans, which included placement of 940 additional traps in parts of two additional areas in an effort to delimit the infestation. In a sizeable area surrounding the Yeager Mountain infestation, 169 traps caught 663 moths. Some 50 miles south of this infested area two traps attracted single moths at widely separated points in northern Bucks County. Trapping in the 1956 and 1957 sprayed areas, and in the balance of the area surveyed, was negative. Intensive scouting in and around positive trap sites in Bucks County and in other selected locations disclosed no egg deposition.

In New Jersey, 4,550 traps were placed on a 7/8 mile grid pattern throughout the northern third of the State. Single moths were recovered at three widely separated locations at Mendham, Long Valley and Clinton. During the winter and spring the three positive trap sites and environs and other selected locations were intensively scouted with negative results.

In non-regulated sections of New England, 888 traps were employed to determine any spread to the north and east. Trap placement was limited to roadsides and favorable or susceptible growth situations in all cases. Single moths were captured in the towns of Cambridge, Morristown and Stowe, Lamoille County, Vermont, all in the vicinity of sites where single moths were captured in 1956. No moths were caught in areas trapped in Maine and New Hampshire.

In Massachusetts, approximately 1,500 traps were used by the State cooperator to survey sections of Barnstable, Plymouth, Duke, Norfolk and Bristol Counties, principally to detect any reestablishment of infestations, particularly in areas sprayed in previous years. In this area, 392 traps attracted 1,203 moths.

Limited roadside trapping in Virginia and West Virginia was negative.

Scouting conducted by both Division and Cooperating Agency personnel throughout the generally infested area disclosed the gypsy moth population to be at its lowest ebb in many years.

3. Statement of Pest Damage

During the summer, cooperative aerial surveys were conducted in all infested states to observe occurrence, intensity and extent of defoliation. The survey disclosed only 6,458 acres defoliated, the lowest in any year since 1950 when 5,368 acres were defoliated. Most of the defoliation was observed in adjoining sections of

Litchfield, Hartford and New Haven Counties in Connecticut.

Summary of Gypsy Moth Defoliation - FY 1958
Summer of 1957

Acreage Defoliated and Degree of Defoliation

State	75-100%	Less than 75%	Total
Connecticut	0	4909	4909
Maine	0	120	120
Massachusetts	3	13	16
New York	155	703	858
Pennsylvania	30	30	60
Vermont	0	495	495
Totals	188	6270	6458

No defoliation observed in New Hampshire and New Jersey

D. Eradication or Control

1. Procedure or techniques used

Preliminary aerial surveys are conducted over proposed spray areas to develop information on spray boundaries, type of terrain, sensitive areas and hazards, and to estimate spray plane needs. These surveys are followed by intensive ground checking together with preparation of maps, instructions and other details pertinent to spray operations. After estimates on acreage, gallonage, and plane requirements have been determined, spray bid specifications are mailed to prospective bidders. About the same time, program information is released by all cooperating agencies through newspaper, radio and TV channels and meetings with interested groups.

Outlying and peripheral infestations are treated by aircraft using DDT at one pound in one gallon of diluent per acre. Large type planes are used in applying sprays in woodlands. Small type planes are used to spray hedgerows situations and critical areas. All spray planes are checked for calibration and swath width by the Division's aircraft specialists who also are available throughout the program to check spray operations from the air. Application is also observed by ground crews who use dyed cards to check spray deposit. Observation pilots and ground crews are equipped with radios to relay information to operating headquarters and to receive instructions. Helium-filled kytoons are used extensively to mark spray boundaries and flight strips, and to spot sensitive areas requiring special precautions and precise application.

2. Accomplishments

This year's eradication program involved the aerial treatment of 493,200 acres in Pennsylvania to eliminate the Yeager Mountain infestation. In this cooperative effort, 107,500 acres were sprayed under State contract and 385,700 acres under Federal contract.

The State contract, package type for both insecticide and application, was awarded to Chris Stolzfus, Coatesville, Pennsylvania. Application was started April 24 and completed May 20. Spraying was accomplished with 2 TBM's and 2 Stearman biplanes (450 hp.).

The Federal contract was split three ways. An application contract for applying insecticide on approximately 73,000 acres, was awarded to Chris Stoltzfus, Coatesville, Pennsylvania. The contract for delivery of finished DDT solution at designated airports was awarded to United Heckathorn, Richmond, California.

Spraying of sensitive areas was started May 9 and completed May 24. This involved the use of 6 Stearman biplanes (450 hp.) operating as one unit.

The large plane operation was started May 5 and finished June 15. The work was accomplished with one B-17 and one C-82. During the period May 1, when work was scheduled to start, to June 15, when it was completed, only 19 of the 38 workdays were suitable for spraying.

In New York, two small isolated infestations on Long Island and other isolated spots in the suppressive area, totalling 63 acres, were treated for eradication with ground equipment.

Aircraft Used on 1958 Eradication Program

Type of Aircraft	No. Used	Avg. Load (Gal.)	No. Trips	Total Gal. Sprayed	Total Acres Sprayed
Federal Contract					
Boeing B-17	1	2,045	70	143,164	145,605
Fairchild C-82	2	2,000	82	163,713	166,400
Stearman 450 hp.	6	141	280	39,511	73,695
State Contract					
Grumman TBM	2	630	147	92,542	92,700
Stearman 450 hp.	2	170	65	11,033	14,800
Totals	12		644	449,962	493,200

Within the generally infested area cooperating state and local agencies sprayed 41,313 acres of heavily infested woodlands to suppress populations and prevent defoliation. See Table #2.

E. Regulatory

1. Procedures or techniques used

Regulatory activities are directed toward prevention of artificial spread of the moth into areas where eradication treatments have been applied (the suppressive area), and into non-infested sections of the country and Canada. Movement of nursery stock, forest and quarry products and other commodities which constitute a hazard of spread is regulated under Federal Quarantine No. 45. Intrastate movement of such products is regulated under paralleling State quarantines. With certain exceptions shipment of regulated products moving from regulated areas must be accompanied by a certificate or limited permit. Certain regulated articles may be moved from establishments issued a Certificate of Exemption when found free of infestation or when approved insecticides have been applied.

2. Accomplishments

Inspectors stationed throughout the regulated area furnished inspection and certification services and information to regulated industries, shippers and others throughout the year. Inspectors outside the regulated area furnished quarantine information to shippers and checked shipments of regulated products for quarantine compliance.

In the late fall, the New York State Department of Agriculture and Markets established roadblocks in southern New York in an intensive effort to stop movement of uncertified Christmas trees and greens from the generally infested area into and through the suppressive area. Two Federal inspectors were assigned to assist with inspection and certification of products found to be moving in violation of the quarantine. Most violations involved individual trees or greens transported in private vehicles. No infestation was found in materials inspected.

There were no revisions of the Federal quarantine and related administrative instructions during the year. On September 10, 1957, following application of eradication treatments in the spring and subsequent negative trapping in the summer of the same year within the regulated area, the State of Pennsylvania revised its quarantine to release from regulation all areas quarantined at that time in Wayne, Pike and Monroe Counties.

Effective September 20, 1957, the quarantine was again revised to place under regulation the area found infested in the summer of 1957 in the Counties of Luzerne, Carbon, Monroe and Lackawanna.

F. Methods Improvement

1. Work performed

In cooperation with the Pesticide Chemicals Research section a series of experimental trap lines were operated in the vicinity of Milford, New Hampshire, to test synthetic lures for use in traps. PPC personnel selected suitable operating sites for the more than 2,500 traps and furnished supervision, labor and transportation for the testing program. Various kinds and types of traps were also field tested, including plastic traps.

In a continued effort to improve methods for gypsy moth eradication, more than 40 chemical compounds were laboratory tested early in the year and the most promising of these were tested in field plots. Intensive surveys conducted in northern New York resulted in the location of 16 plots, each containing 20 acres, with sufficient infestation to permit field tests. Compounds that showed promise were also tested for phytotoxicity, toxicity to fish, persistence on forage and pasture crops, and residue in milk. Included was a quick-breaking DDT emulsion which appeared to be as effective as the standard DDT oil solution, but less injurious to plant life and less toxic to fish.

Insecticide manufacturers and research agencies in England, Germany and Switzerland were contacted in conjunction with foreign pupal collection activities in order to gain information regarding insecticides being used in Europe for gypsy moth control; to stimulate interest in the development of new insecticides for this purpose; and to encourage the expansion of present screening programs to include the gypsy moth. It is hoped that this will result in the introduction of new chemicals for testing in 1959.

2. Accomplishments

Although a final analysis of the effectiveness of the insecticides tested cannot be made until after egg deposition, the following insecticides showed promise at a dosage of one pound per acre: Sevin, Bayer 22408, Malathion and Thiodan. The quick-breaking DDT emulsion was effective in killing larvae and was less phytotoxic, but it killed fish.

G. Other

1. Cooperation received during fiscal year

a. Major Contributions

State pest control or regulatory agencies cooperated in varying degrees in the enforcement of the quarantine by furnishing full-time or seasonal inspectors, vehicles and equipment for inspection and certification work. County Agents provided information relative to the spray program and other program activities. Newspaper, radios and television stations disseminated information. Several insecticide manufacturers assigned representatives to assist with the field testing of insecticides.

b. Cooperative work needing strengthening

There is need for strengthening understanding of State financial and other responsibilities associated with planning and execution of the cooperative spray program.

2. Associated Activities

During the year talks on the gypsy moth were given, and the colored sound film and slides were shown on numerous occasions before interested conservation and school groups. Exhibits were displayed at several fairs and bulletins and leaflets were distributed to interested persons. Prior to the start of the spray program and trap survey, news releases were distributed to papers in the area involved. County Agents were kept fully informed on program activities.

III. Recommendations for Coming Year

A. Survey

Continue systematic trap surveys in all areas sprayed for eradication to check effectiveness of treatment and to determine essential quarantine actions. Continue systematic trap surveys outside regulated areas.

Continue scouting surveys essential to regulatory operations. Also, scout attracting trap site locations in suppressive and non-regulated areas.

Trap favorable growth along highways and other suspect locations in northern New England and in southern sections of the Region.

B. Eradication or Control

Resume long-range eradication program in New York at earliest possible date.

C. Regulatory

Streamline quarantine regulations and evaluate certification procedures.

Seek settlement of current certification requirements and lack of exemption recognition by Canada.

D. Methods Improvement

Continue testing of insecticides and formulation to improve eradication methods.

Continue tests to develop a synthetic trap lure and a trap that will require only infrequent visits by trap tenders.

There is a continuing and urgent need for electronic or mechanical equipment for guidance of spray aircraft, as precise application is vital to objective accomplishment.

E. Associated Activities

Increase use of sound film, colored slides and projectographs.

Prepare portable exhibits for display at fairs, shows, etc.

GYPSY MOTH

TABLE #1

EASTERN REGION

SUMMARY of REGIONAL FIELD ACTIVITY

FISCAL YEAR 1958

STATE AND COUNTY	SURVEY								ACRES DEFOLIATED BY GYPSY MOTH
	OUTSIDE REGULATED AREA				INSIDE REGULATED AREA				
	NUMBER OF			INFESTATIONS LOCATED BY FINDING EGGS OR LARVAE ONLY	NUMBER OF			INFESTATIONS LOCATED BY FINDING EGGS OR LARVAE ONLY	
	TRAPS IN USE	TRAPS CATCHING	MOTHS TRAPPED		TRAPS IN USE	TRAPS CATCHING	MOTHS TRAPPED		
A	B	C	D	E	F	G	H	I	J
Connecticut	-	-	-	-	-	-	-	-	4,909
Delaware	-	-	-	-	-	-	-	-	-
Maine	280	-	-	-	-	-	-	-	120
Maryland	-	-	-	-	-	-	-	-	-
Massachusetts	-	-	-	-	1,500	392	1,203	1*	16
New Hampshire	18	-	-	-	-	-	-	-	-
New Jersey	4,550	3	3	-	-	-	-	-	-
New York	11,353	-	-	-	6,832	109	227	10	858
Pennsylvania	4,217	171	665	1	-	-	-	-	60
Rhode Island	-	-	-	-	-	-	-	-	-
Vermont	590	3	3	-	-	-	-	-	495
Virginia	75	-	-	-	-	-	-	-	-
West Virginia	175	-	-	-	-	-	-	-	-
Total This Period	21,258	177	671	1	8,332	501	1,430	11*	6,458

* Information Incomplete

Grand Total Since Apr. 1, 1956 49,616

PPC Form 7-7

GYPSY MOTH

TABLE #2

FISCAL YEAR 1958

EASTERN REGION

SUMMARY of REGIONAL FIELD ACTIVITY

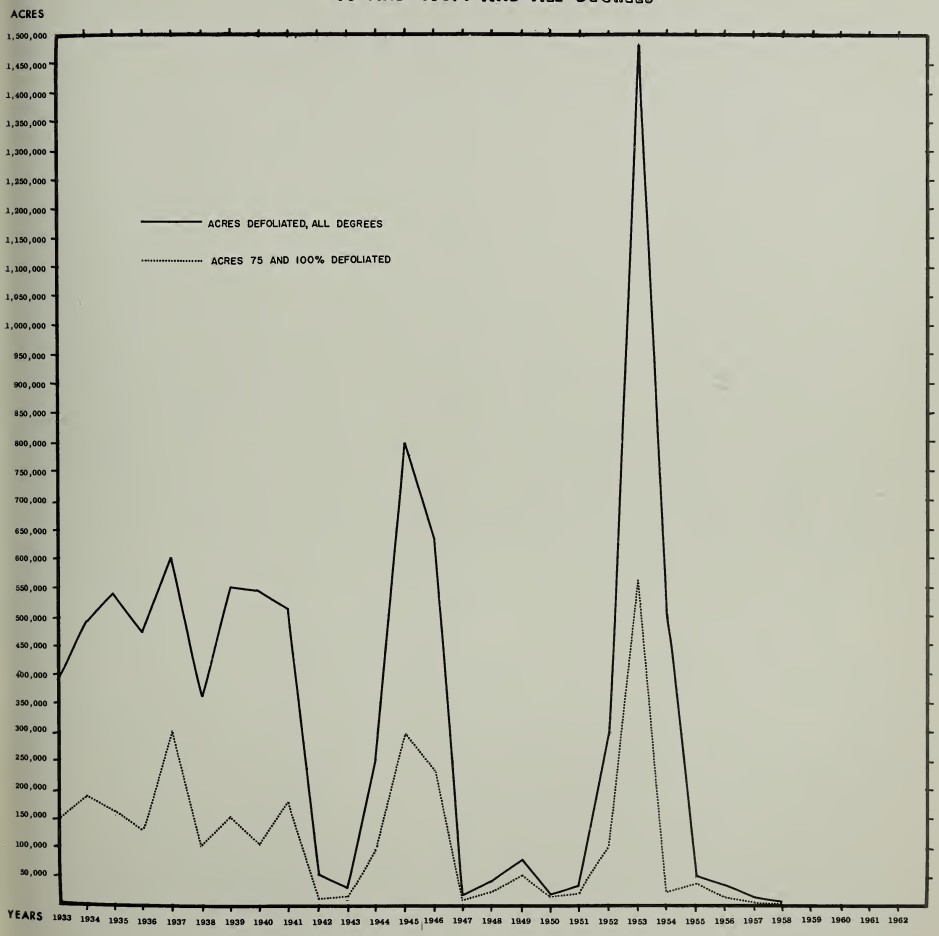
STATE	ACRES SPRAYED				CERTIFICATION SERVICES		
	ERADICATION		SUPPRESSION				
	FEDERAL CONTRACT	STATE AND OTHER	FEDERAL CONTRACT	STATE AND OTHER	SHIPPERS SERVICED	TOTAL SERVICE CALLS	ESTIMATED VALUE PRODUCTS CERTIFIED
A	B	C	D	E	F	G	H
Connecticut	-	-	-	10,808	-	1,356	2,100,952
Delaware	-	-	-	-	-	-	-
Maine	-	-	-	137	-	2,988	3,349,842
Maryland	-	-	-	-	-	-	-
Massachusetts	-	-	-	9,700	-	2,293	1,029,821
New Hampshire	-	-	-	-	-	1,829	2,255,071
New Jersey	-	-	-	-	-	-	-
New York	63	-	7	2,305	-	9,326	10,593,436
Pennsylvania	385,700	107,500	-	-	-	-	-
Rhode Island	-	-	-	18,350	-	678	516,849
Vermont	-	-	-	6	-	4,068	3,398,730
Virginia	-	-	-	-	-	-	-
West Virginia	-	-	-	-	-	-	-
District of Columbia	-	-	-	-	-	-	-
Total- 7/1 - 6/30/58	385,763	107,500	7	41,306	-	22,538	23,244,701
Total - since 4/1/56	3,872,703	223,757	40,202	644,581	-	46,517	50,206,076

PPC Form 7-7A

GYPSY MOTH

ACRES DEFOLIATED IN NEW ENGLAND AND EASTERN NEW YORK, 1933-1958

75 AND 100%, AND ALL DEGREES



HALL SCALE

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PROGRAM ANNUAL REPORT
1958 FISCAL YEAR

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

HALL SCALE

July 1, 1957 - June 30, 1958

Cooperating Agencies:

California State Department of Agriculture
Bureau of Entomology
Butte County Department of Agriculture
Yolo County Department of Agriculture

October 30, 1958
Oakland, California

Jim R. Dutton
Regional Supervisor

TABLE OF CONTENTS

HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishment for the Fiscal Year

The treatment phase of Hall scale eradication was concluded during the current fiscal period. Final fumigations were applied to 1,761 host plants on 475 properties in two infestations remaining under treatment. With these final treatments, all known infestations have now received a prescribed routine of three consecutive fumigations. Host removals continued to supplement the treatment phase of the program. In this respect, 2,150 volunteer seedlings and 88 cultivated hosts were removed from within the eradication areas. A survey to delimit known infestations was also completed, with inspection being made of 48,222 hosts on 755 properties. No new infestations were found during the year.

A survey was made during May and June 1958 of the sites in Florida, South Carolina, North Carolina, Tennessee, Arkansas, and Oklahoma, to which host plants of the Hall scale had been shipped prior to the discovery of this insect in California. There was a possibility that some of the hosts shipped to these localities were infested at the time they were moved. Many of the trees had died, others had been grubbed out to make room for improvements, but a few remained. These showed no sign of Hall scale infestation.

Hall scale inspections had been made prior to 1958 in other southern states. This survey completes the planned inspection of the properties to which hosts of the Hall scale had been shipped prior to and about the time the pest was discovered in California.

Major Deviation from Work Plan

The planned program of inspecting areas adjacent to known infestations for a period of three years, subsequent to final treatment, was somewhat curtailed this year. This was due in part to adverse weather conditions during the inspection period, which prevented the optimum use of manpower. As a result of this condition, one-third less inspection was accomplished than had been planned.

Status of Program at Close of Year

With the completion of fumigations made this year, all nine known infestations of Hall scale have now received final

treatment. Plans to inspect 72,500 hosts within a $\frac{1}{2}$-mile radius of these infestations were somewhat curtailed due to adverse weather conditions existing during the inspection season. However, the delimitation survey of the U. S. Plant Introduction Garden, Stilson Canyon, and the City of Chico infestation area was completed. In addition, approximately 67 percent of the planned inspection in the Rath area was accomplished.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

How planned and directed

This eradication program is conducted in cooperation with the Bureau of Entomology of the California State Department of Agriculture, the Agricultural Departments of Butte and Yolo Counties, and the Plant Pest Control Division. Yearly conferences are held with the cooperating agencies to formulate plans for the year's activity. The Chief of the Bureau of Entomology represents the California Department of Agriculture, the County Agricultural Commissioners represent the Counties, and the Plant Pest Control Division is represented by the State Supervisor.

Actual field supervision of the inspection and eradication activities is a direct responsibility of the Plant Pest Control Division.

Technical Assistance

Technical assistance provided to farmers and others by program personnel

None

Technical assistance provided to program by cooperating agencies

No technical assistance was received from any agency during the year, other than the identification of specimens collected by inspectors and submitted to taxonomists of the Bureau of Entomology, California State Department of Agriculture, for identification.

Survey

Procedures or techniques used

No deviation from general program procedure was made this year.

Accomplishments

A thorough inspection centering around six Butte County infestations was conducted during the fiscal year. The inspection was divided into two phases, regular and postfumigation. Regular inspections were made during the fall, spring, and winter months, while postfumigations were accomplished during the midsummer months on current and second-year wood. Postfumigation inspections were made only on properties which were known to have been infested, or those in close proximity to previously infested properties.

Statement of crop losses

Hall scale has never been widespread in the fruit-growing areas of California. This eradication program is aimed at complete elimination of the pest, and at this date no active infestations are known to exist. Therefore, no crop losses are being sustained by the growers.

Eradication or Control

Procedures or techniques used

There were no deviations from the prescribed schedule of treatments.

Accomplishments

All known infestations have now received the prescribed course of treatment. Final HCN fumigations were completed in Butte and Yolo Counties during October and November 1957. As of June 30, 1958, no live Hall scale was known to exist in the State of California.

Regulatory

Procedures or techniques used

All quarantine restrictions were removed in April 1958. At the time they were reworked, the application of the quarantine regulations was the responsibility of the California State and County Departments of Agriculture.

Accomplishments

Not applicable.

Methods Improvement

Work performed

All techniques used on this program have been successfully employed during previous seasons and found effective. No innovations were tried during this period.

Accomplishments

Not applicable.

Other

Cooperation received during fiscal year

The California Department of Agriculture employs seasonal help for fumigation and has provided one-half the inspection personnel on a matching basis with the Plant Pest Control Division. As in past years, this organization furnished much of the motor equipment used in field inspection. It also provided a garage, office, and storage facilities at Chico, California. The Agricultural Commissioners of Butte and Yolo Counties, and the Bureau of Plant Quarantine of the California State Department of Agriculture conducted all quarantine activities until the quarantine was removed in April 1958.

Associated activities and services

None

RECOMMENDATIONS FOR COMING YEAR

Survey

Current plans call for completion of the unfinished portion of the 1958 fiscal year's planned inspection. This will amount to inspecting 26,000 Hall scale hosts. It is also intended that a reinspection will be made of all hosts within a $\frac{1}{2}$-mile radius of the Johnson, Rath, Bidwell Park, Oroville, and Davis infestations. There are approximately 54,000 hosts within these areas.

A continuation of periphery inspection should be made as time and funds permit.

Eradication

The treatment phase of the program has been completed and, unless other infestations are found by further inspection, no additional fumigation is planned.

Regulatory

None

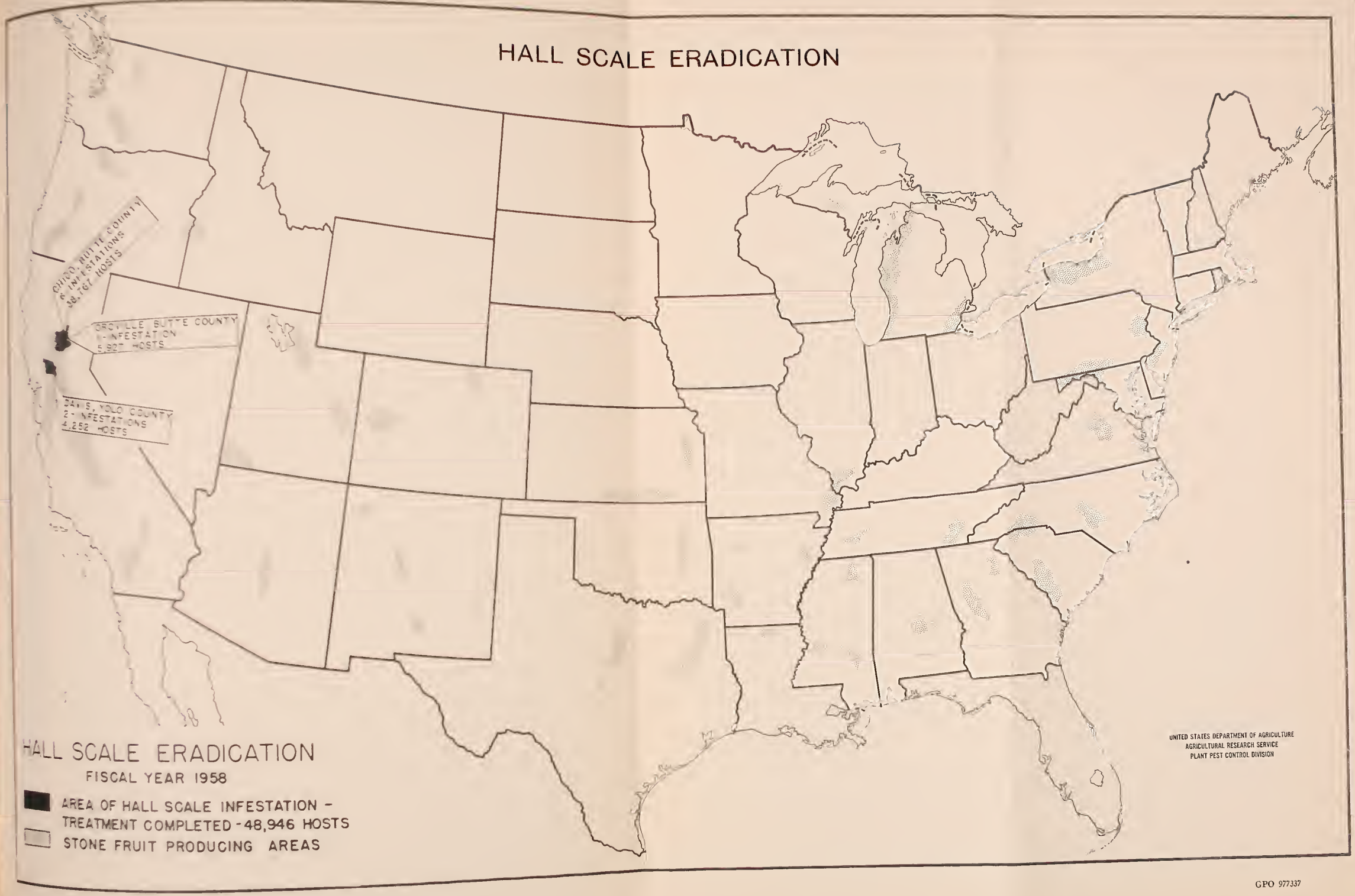
Methods Improvement

None

Other

None

HALL SCALE ERADICATION



GPO 977337

INSPECTION OPERATIONS SUMMARY
HALL SCALE

State: California

Fiscal Year 1958

Area	City Blocks	No. Properties	Hosts Inspected	Hosts Infested
Infestation Area				
Chico City	16	146	2,362	0
Microscopic			21	0
Davis City	8	232	1,433	0
Oroville City	12	182	989	0
Rath		49	23,467	0
Stilson Canyon		4	524	0
U.S. Plant Introduction Garden		2	3,396	0
Postfumigation				
Bidwell Park		17	637	0
Chico City	9	45	138	0
Oroville City	11	73	288	0
Stilson Canyon		2	379	0
U.S.P.I.G.		3	14,588	0
Totals	56	755	48,222	0
Cumulative totals since beginning of program	4,353	39,183	974,604	2,960*

*Represents actual infested hosts.

TITRATION SUMMARY
HALL SCALE

State: California

Fiscal Year 1958

Area	Date	No. Samples	Percentage of Loss of HCN over Period 5 to 40 Minutes			Concentration of HCN mg/L over 50-Minute Period		
			Low	High	Average	Low	High	Average
Chico	Oct.	24	0.81%	13.01%	5.86%	1.17 mg	9.70 mg	6.16 mg
	Nov.	8	2.19%	17.70%	8.24%	5.82 mg	6.75 mg	6.35 mg
Davis	Nov.	5	5.85%	16.00%	8.56%	3.00 mg	8.13 mg	6.21 mg
Total		37	0.81%	17.70%	6.70%	1.17 mg	9.70 mg	6.21 mg

CONTROL OPERATIONS SUMMARY - FUMIGATION - HOST REMOVAL
HALL SCALE
1941 to June 30, 1958

State: California

Fiscal Year 1958

Treatment Area	Hosts on Infested Properties	Additional Hosts within Treatment Area	Total Hosts	Hosts Removed	Treatment Completed	Remaining to be Treated
Chico, Butte Co.						
U.S.P.I.G.	15,000		15,000		15,000	0
Bidwell Park	5,407	8,155	13,562	5,951	13,562	0
Johnson	3,600		3,600		3,600	0
Rath	500		500		500	0
Stilson Canyon	864	62	926	548	926	0
Chico City	6	5,173	5,179	3,741	5,179	0
Oroville, Butte Co.						
Oroville City	629	5,298	5,927	3,990	5,927	0
Davis, Yolo Co.						
Univ. of Calif.	2,800		2,800	2,800	2,800	0
Davis City #1	30	561	591	216	591	0
Davis City #2	75	786	861	538	861	0
Totals (10)	28,911	20,035	48,946	17,784	48,946	0

TREATMENT OPERATIONS SUMMARY
HALL SCALE

State: California

Fiscal Year 1958

Area	Date	No. Blks.	No. Prop.	Hosts Fumigated	Hosts Removed	Total Hosts	Man Days	Schedule	Units	Lbs. HCN
Chico City	Oct.	44	244	1,047	49	1,096	336	35cc	17,068	919.04
Chico City	Nov.	27	112	391	30	421	100	35cc	4,093	220.39
Davis City	Nov.	15	119	323	9	332	60	35cc	3,285	191.34
Totals		86	475	1,761	88	1,849	496	35cc	24,446	1,330.77

EXPENDITURES BY SOURCE AND BY ACTIVITY
HALL SCALE

State: California

Fiscal Year 1958

Source of Cash & Equivalent*	1 Planning & Direction	2 Technical Assistance	3 Survey	4 Control	5 Regulatory	6 Methods Improvement	7 Other	8 Total
Plant Pest Control Division	$5,000	$ -	$49,753	$5,500	$	$	$	$60,253
Other Organizations (Name)								
Calif. Dept. of Agriculture	500	250	23,500	4,500				28,750
Subtotal-Other Organizations	500	250	23,500	4,500				28,750
Total (of PPC & Other)	5,500	250	73,253	10,000	-	-		89,003
Contributed Services**								
Calif. Dept. of Agriculture	3,900	-			15,544			19,444
Counties	250	-	1,000	1,000	-	-	-	2,250
Total	4,150		1,000	1,000	15,544			21,694
Grand Total	$9,650	$250	$74,253	$11,000	$15,544	$ -	$	$110,697

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

COOPERATIVE AID RECEIVED
HALL SCALE

State: California

Fiscal Year 1958

State and Source of Aid	1	2	3	4	5	6	7	8
	Cash and Equivalent Aid*				Total of Cash & Equiv.	Intangible Service Estimate**	Source Grand Total	Remarks
	Cash	Personal Services	Equipment & Supplies	Space				
	$	$	$	$	$	$	$	
California State Department of Agric. (Bureau of Entomology & Bureau of Plant Quarantine)		27,250	-	1,500	28,750	19,444	48,194	
Counties						2,250	2,250	
Total This Period	$	$27,250	$ -	$1,500	$28,750	$21,694	$50,444	

*Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available.

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

HOJA BLANCA

July 1, 1957 - June 30, 1958

In cooperation with other
Federal, State, County, and Local Agencies

November 15, 1958
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

A disease of rice, commonly referred to as hoja blanca, which is known to be transmitted by at least one leafhopper (Sogata orizicola), was found on three properties near the city of Belle Glade, Palm Beach County, Florida. Arrangements were made for the rice plantings involved to be destroyed, and malathion sprays were applied through the use of both ground equipment and aircraft to the infested fields and environs in order to control leafhopper vectors. Surveys were carried on in 16 counties in south Florida to locate plantings currently in existence and check for volunteer rice in fields which had previously been planted.

B. Major deviation from Work Plan

None

C. Status of Program at close of year

In the Belle Glade area, volunteer rice was present in the fields which had been found infested in the summer of 1957. At the close of the report period, work was under way to destroy this volunteer rice. No symptoms of hoja blanca were found in the volunteer rice in these fields; however, insecticidal sprays were being continued to control any leafhopper vectors. Symptoms similar to hoja blanca were reported in wild grasses in a few locations in the Belle Glade area.

II. Program Activity during fiscal year

A. Planning and direction

1. How planned and directed

Following the report of infestations, meetings were held with State Experiment Station and regulatory personnel, along with research and control personnel, of the U. S. Department of Agriculture. After a review of the problems, an eradication plan was agreed upon which was to be handled cooperatively by the State and Federal control agencies with advice from the State and Federal research groups.

B. Technical Assistance

1. Technical Assistance provided to farmers and others by program personnel

Rice growers were advised regarding cultural practices that

could be followed to assist in eliminating the disease, which basically consisted of destroying the rice through plowing. The farmers were also requested not to plant rice in the Belle Glade area during the next crop season.

2. Technical assistance provided to program by cooperating agencies

State and Federal research agencies cooperated with program personnel in outlining the cooperative eradication efforts and kept in close contact with the work during the course of the program in order to offer additional suggestions.

C. Survey

1. Procedures or techniques used

Information was obtained from county agents, Fish and Wildlife personnel, sportsmen groups, and others in an attempt to locate all rice plantings presently in existence and a record of plantings in south Florida in recent years. Following the accumulation of the data, visits were made to all fields and the rice crop or volunteer plantings, where in existence, were surveyed for visual symptoms of the disease. Where suspicious symptoms were noted, arrangements were made with personnel of research organizations who had field experience with the disease in other countries to visit the area in order to check on the identification of the symptoms. Plant Pest Control inspectors who conducted the survey visited the infested area in Belle Glade prior to their survey work in order to become familiar with the symptoms of this disease. Sweepings for leafhoppers were made prior to the beginning of the eradication treatments in order to determine whether the known vector, Sogata orizicola, was present in this area. A few specimens were taken. Arrangements were made for the operation of light traps at several locations in south Florida; and, in addition, sweepings at planned intervals were made to determine what species of leafhoppers that may be possible vectors of the disease were present in that area.

2. Accomplishments

As shown on the attached map, inspections were made in seven counties for volunteer rice as a result of previous plantings. In these seven counties, no volunteers were found. In eight additional counties, inspections were made either of planted rice fields or of volunteer plants in fields which were previously cropped to rice. Surveys in these fields covered approximately 1,700 acres.

Infestations were found only on the three properties in the Belle Glade area of Palm Beach County. No additional specimens of Sogata orizicola were taken as a result of the light trap operations and the systematic sweepings at periodic intervals; however, other species of Sogata were recovered.

3. Statement or table of pest damage

Very few commercial plantings were involved, all of which were in the Belle Glade area. Loss to seed production was involved; although no estimates were made since arrangements were completed to destroy all of the crop prior to harvest. Some of the rice fields inspected were experimental plantings, and some others were planted for use as food for game birds.

D. Eradication or control

1. Procedures or techniques used

An insecticidal application, consisting of 4 pounds of 25 percent malathion wettable powder, was applied to the infested area and a large marginal area through the use of aircraft prior to the destruction of the rice plantings. As soon as possible after the aircraft applications were completed, the infested rice fields were destroyed by plowing. Since all of the rice could not be destroyed as promptly as desirable after the initial application by aircraft, because of weather conditions and other factors, an additional insecticidal treatment was applied by plane. Most of the rice fields were planted to truck crops during the winter months, during which time volunteer rice plants were destroyed in connection with cultural practices. Following the harvesting of the truck crops in the spring of 1958, arrangements were made for plowing the fields to destroy volunteer rice which was appearing. In addition, malathion sprays were applied in the fields and environs on a one-week schedule to control leafhoppers.

2. Accomplishments

Malathion sprays were applied to approximately 2,100 acres on and in the environs of the three infested properties at Belle Glade. All of the rice plantings were destroyed.

E. Regulatory

No quarantine regulations were in effect; however, it was possible to obtain the cooperation of growers in the area classified as generally infested whereby they would not plant rice during the 1958 crop season.

F. Methods Improvement

Not applicable

G. Other

1. Cooperation received during fiscal year

Arrangements were made with growers having infested properties to destroy the rice by plowing, a procedure which was valued

at approximately $2,100 had it been necessary to do the work under contract. In addition, the growers in that area agreed not to plant rice during the 1958 crop year, for which no evaluation was established.

2. Associated activities and services

A number of news releases were issued during the year to keep the public well informed regarding the presence of the disease in the Belle Glade area and, particularly, to solicit cooperation in the eradication efforts, primarily through the non-planting of rice.

III. Recommendations for the coming year

A. Survey

Surveys should be conducted of fields which have previously been planted to rice in the Belle Glade area in order to determine where the symptoms may be detected on any volunteers that may appear. These surveys should include, also, a number of wild grasses, since it is suspected that they may be carriers of the disease.

If no hoja blanca is found during the 1958 crop year on any volunteer rice, it is believed that the operation of light traps and the periodic sweepings throughout south Florida for species of leafhoppers could be discontinued.

B. Eradication or control

The destruction of volunteer rice in the previously known infested fields should be continued through the 1958 crop year, and possibly through the 1959 crop year, dependent upon the development of further research information.

C. Regulatory

It probably will be desirable to again request growers not to plant rice in previously known infested areas in 1959.

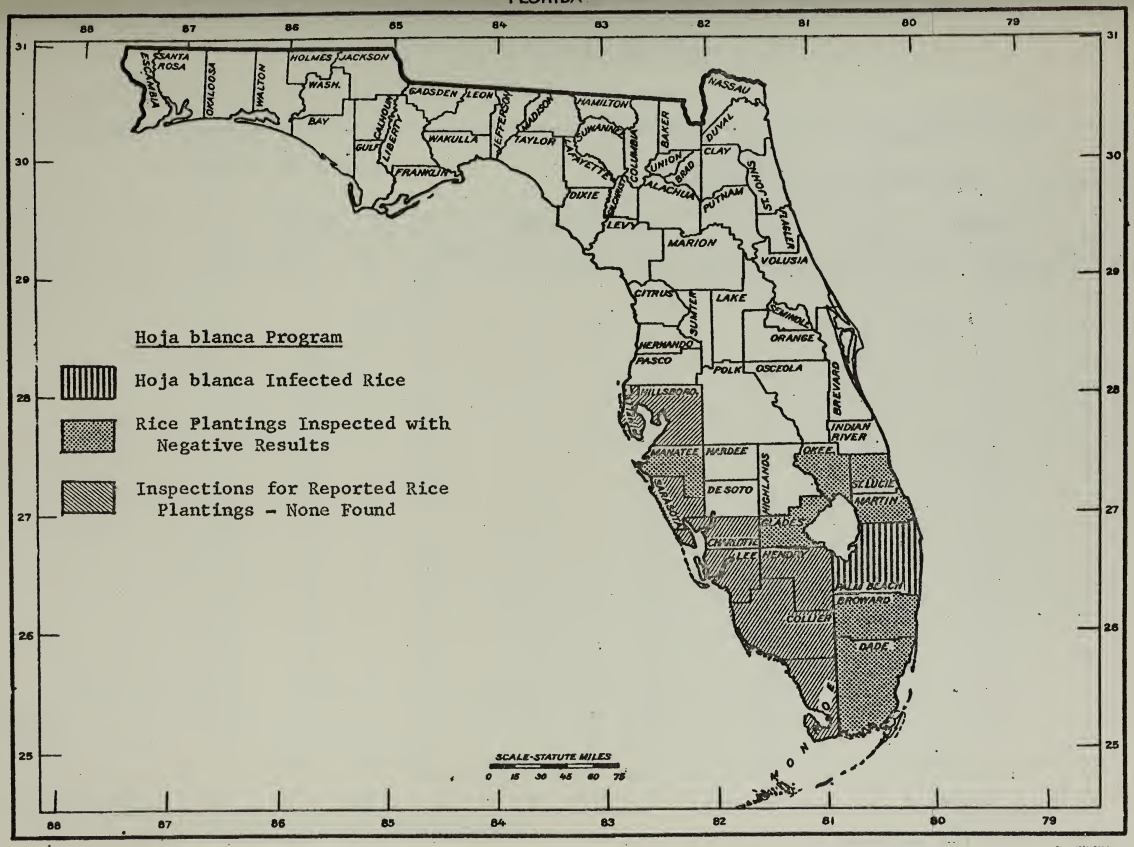
D. Methods Improvement

None

E. Associated Activities

Periodic news releases should be issued to keep the public informed regarding the status of the program and ways and means by which they may assist in obtaining the final goal of eradication.

FLORIDA


Hoja blanca Program
Hoja blanca Infected Rice
Rice Plantings Inspected with Negative Results
Inspections for Reported Rice Plantings - None Found
SCALE-STATUTE MILES
0 15 30 45 60 75
SANTA ROSA
ESCAMBIA
OKALOOSA
WALTON
HOLMES
JACKSON
WASH.
BAY
GULF
CALHOUN
LIBERTY
FRANKLIN
GADSDEN
LEON
WAKULLA
JEFFERSON
MADISON
TAYLOR
HAMILTON
SUWANNEE
LAFAYETTE
COLUMBIA
BAKER
NASSAU
DUVAL
CLAY
UNION
BRAD
ALACHUA
PUTNAM
ST. JOHNS
FLAGLER
DIXIE
GILCHRIST
LEVY
MARION
VOLUSIA
CITRUS
SUMTER
LAKE
SEMINOLE
ORANGE
HERNANDO
PASCO
POLK
OSCEOLA
BREVARD
WILLISCOSA
INDIAN RIVER
MANATEE
HARDEE
OKEE.
HIGHLANDS
ST. LUCIE
DE SOTO
MARTIN
CHARLOTTE
GLADES
LEE
HENDRY
PALM BEACH
BROWARD
COLLIER
DADE

HOJA BLANCA

Region	Prepared by
Southern	

Period *(Designate: Month, 1-15, 16-31, or 1-31)*	Date prepared
Fiscal Year 1958	

STATE COUNTY LOCALITY A	SURVEY		INFESTATIONS FOUND			CONTROL			
				Acres		Chemical		Cultural	
	Properties B	Acres C	Properties D	Cultivated E	Non-cultivated F	Properties G	Acres H	Properties I	Acres J
Florida	26	1,726	3	311	0	3	2,950	3	374
Total This Period									
Total From July 1	26	1,726	3	311	0	3	2,950	3	374
Total From Beginning of Program	26	1,726	3	311	0	3	2,950	3	374

Report: Total counties by States infested from beginning of program

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

SUMMARY OF ASSOCIATED ACTIVITIES

Program Roja Blanca

Region Southern

Prepared by: _____

Fiscal year 1958

Area	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used**				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.*	Infest. Maps & Posters	
Florida	1	1	1	-	-	-	54	-	-	-	-	2
Total												

*Written by Federal personnel for release direct or through cooperators.
**This should be a conservative estimate (accurate record for these items impractical).

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

IMPORTED FIRE ANT

July 1, 1957 - June 30, 1958

In cooperation with other
Federal, State, County, and Local Agencies

November 15, 1958
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

The imported fire ant, a native of South America, apparently gained entry into this country through the Port of Mobile, Alabama, in the early twenties. It has been found in 230 counties and parishes in 9 southern states on approximately 22 million acres.

Funds were provided by Congress in 1957 to undertake the Imported Fire Ant Program as a result of the insistence of the Southern Commissioners of Agriculture and farm groups, including the Farm Bureau. The bill stipulated that the funds would be used to assist state and local governments and individuals in the organization and conduction of a program designed to eliminate the imported fire ant. In September 1957, representatives of the Plant Pest Control Division met with the Southern Plant Board to formulate plans for the program. The objectives as developed at that time were: (1) Locate and delimit all infestations; (2) undertake measures designed to check further spread of this pest; and (3) initiate a program designed to progressively treat, by approved measures, lands supporting infestations of this insect. To accomplish the objectives of this program, a public hearing was called to consider the advisability of quarantines to regulate the movement of hazardous articles from the infested area, and on May 6, 1958, Federal Domestic Quarantine No. 81 was put into effect. This action was followed by paralleling state quarantines regulating the intrastate movement of hazardous articles. A Methods Improvement Laboratory was constructed to carry on studies designed to develop more practical and economical eradication measures. Liaison was established with the U.S. Fish and Wildlife Service at both the Washington and Regional levels. Conferences were held with the U. S. Public Health Service. State and county fire ant committees were organized, and on November 19, 1957, the eradication phases of the Imported Fire Ant Program were begun.

Work began on the outer limits of the infested area and progressed inward. Concurrently, programs were conducted in the heart of the infestation wherever farmers and others organized treatment blocks of sufficient size to reduce the hazard of recontamination or wherever such areas extended to natural barriers or impediments to natural spread.

B. Major deviation from Work Plan

None.

C. Status of Program at close of year

Most of the major points of dissemination for the imported fire ant have been treated. All known infested areas in Arkansas and North Carolina have received insecticidal applications. Treatment of the eastern half of Georgia has been completed. Progressive eradication plans have been drawn up for treatment of infested areas in Florida, Mississippi, and South Carolina. The treatment of outlying infestations in Texas is rapidly progressing, and in Alabama and Louisiana commitments have been made which will use up all federal and cooperator funds presently available to those states.

II. Program Activity during fiscal year

A. Planning and Direction

1. State fire ant committees have been organized in each of the states to assist in planning and developing state programs. These committees are composed of interested agricultural and civic leaders. The State regulatory official, the Extension Entomologist, and the Plant Pest Control Division's state supervisor served as advisors to this committee, and shared the responsibility of direct supervision of the work. In many instances, these state committees were supplemented by similar organizations within the county.

The Division and the State Departments of Agriculture shared the administrative costs of the work as well as the regulatory and survey phases. The cost of eradication measures was shared by state and federal agencies, individuals, and interested local groups.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Through the use of visual aids, exhibits, meetings, personal contact, and actual field demonstration, incentive was developed for full cooperation in the eradication and certification treatments for the imported fire ant. Special efforts were made prior to the inauguration of state and federal quarantines to work with growers who would be affected by these regulations.

2. Technical assistance provided to program by cooperating agencies

State and county fire ant committees worked closely with program personnel in disseminating information to affected

property owners and the general public. These committees assisted in arranging for participation by farmers, city and county governments, industrial concerns, and others. The Extension Service, through its County Agricultural Agents, arranged for and conducted meetings and released timely information to assist in acquainting the public with the program.

C. Survey

1. Procedures or techniques used

a. Field

Surveys were divided into two types: (1) detection surveys made in areas not previously known to be infested, and (2) delimiting surveys made to determine the actual extent of a known infested area. Visual inspection for mounds was used to determine the presence or absence of ants. Most of the surveys were made in the fall and winter months after the surface vegetation had died. Field personnel collected and submitted ant specimens to the laboratory for final species determination. Ecologically, the ant appears to prefer open grassland and cropland areas to shaded or wet areas. It is found less frequently in heavily wooded lands except along roads or trails leading into them.

b. Laboratory

Microscopic examinations of specimens submitted by field personnel were made for species determination.

2. Accomplishments

Surveys determined that approximately 22 million acres were infested with the imported fire ant in 230 counties and parishes of 9 states. A number of isolated infestations were located and their areas delimited.

3. Statement of pest damage

Evidence is available that under certain conditions the imported fire ant economically affects the yield of corn, okra, Irish potatoes, watermelons, peas, beans, and other truck and field crops. Hay crops have been known to be lost after harvest because the ants invaded the bales to the degree that they could not be loaded for transport from the field. Reports have been received of corn that could not be taken from the windrows because of invasion by the ants. The mounds impede the harvesting of hay,

small grains, and clover seed. Farmers have attested to the loss of young livestock from fire ant attacks, and in one year alone over 300 people were treated at the Fort Benning, Georgia, hospital because of fire ant stings.

D. Eradication or Control

1. Procedures or techniques used

The ultimate objective of the Imported Fire Ant Program is eradication. To accomplish this objective, granular insecticide formulations of dieldrin, heptachlor, or chlordane insecticides were applied at the recommended dosage rate to known areas of infestation. This granular-type insecticide was applied by aircraft, ground equipment, or hand seeders. The type of application equipment used was determined by the size of the area to be treated and the hazards involved.

In open cropland and pasture land, aircraft and power operated ground equipment were used. Woodlands and isolated infestations that contained only a relatively few scattered colonies were individually mound-treated by the use of hand seeders. Treatment areas were limited in size and widely scattered, as long as 3 years being required to treat an individual infestation.

2. Accomplishments

From the beginning of the program to the end of this fiscal year, 449,553 acres had been treated in the 9 infested states. Programs in varying degrees of intensity were conducted in 207 of the 230 counties which are known to support infestations of this pest. In 62 of these counties treatment is complete on all known infestations.

E. Regulatory

1. Procedures or techniques used

A federal quarantine and paralleling state quarantines placed in effect during the year restrict the movement of products determined to present hazards in the spread of imported fire ants. These products are made eligible for certification by the elimination of ants through the application of approved insecticides, fumigants, and other sanitary practices required by state and federal inspectors.

2. Accomplishments

Many of the infested properties handling restricted products were treated by approved methods prior to inauguration of the quarantine, thus enabling these products to move into commercial channels without interference.

F. Methods Improvement

1. Work Performed

The Entomological Unit conducted studies along the following lines:

(a) Effectiveness of various dosages of heptachlor and dieldrin as well as evaluation of other insecticides.

(b) Acceptance of various food materials which could be used in a bait.

(c) Development of treatments for nursery stock and other regulated products.

(d) Evaluation of insecticide-fertilizer combinations.

(e) Collection of data on the development of sexual forms in colonies.

Functions of the Chemical Laboratory included:

(a) Analyses of insecticides for compliance with specifications.

(b) Development of new methods, materials, and formulations.

2. Accomplishments

Field plots were established at monthly intervals to determine the minimum effective heptachlor or dieldrin dosage necessary for eradication, time of year most effectively applied, and speed of action in eliminating imported fire ant infestations. Laboratory studies were made to evaluate several promising insecticides, and field tests were begun with chlordane and toxaphene. A number of food materials were evaluated and dry dog food was chosen for use in preliminary bait tests.

Evaluation of various treatments for balled and burlapped nursery stock was made, and the use of methyl bromide fumigation or ethylene dibromide-chlordane dips was recommended.

Field plots for the evaluation of the insecticide-fertilizer combinations in row crops have been established. Collections have been made at regular intervals to determine when alate forms and sex brood are present in the mounds.

Samples representing 3,599,900 pounds of insecticides were analyzed for compliance with specifications. Approximately 5,800 pounds of fertilizer were impregnated with insecticides, and 35 kilos of aerosol fumigant were formulated. Some 1,500 pounds of experimental granules of various formulations were made, and studies were commenced with the aim of producing a better granule of more efficient killing power.

G. Other

1. Cooperation received during fiscal year

State and local committees and interested local civil officials played a major part in the organization and development of cooperative programs. The Extension Service through its entomologists and county agents, contributed greatly to the program in the educational phases of the work by preparing and distributing bulletins and furnishing program information to the public through the medium of newspaper articles, radio, television, and public appearances. Louisiana State University, Mississippi State University, and Alabama Polytechnic Institute carried out studies of eradication measures which augmented work being done at the Methods Improvement Laboratory. Various federal agencies, such as the Department of Defense and the U. S. Forest Service, contributed funds, equipment, and personnel where eradication measures were being carried out on their lands. The Civil Aeronautics Administration assisted in the inspection and certification of aircraft. The U. S. Public Health Service and the U. S. Bureau of Sport Fisheries and Wildlife assisted in conducting studies and provided information on ways to alleviate hazards of application. The Animal Disease Research Division of Agricultural Research Service provided timely information as to the results of the toxicity studies of animal tissues taken from livestock pastured within the treated area.

III. Recommendations for coming year

A. Survey

Surveys should be continued in the general infested area only to the degree that they are needed to guide regulatory and control operations. In outlying areas of infestation, surveys should be continued to determine the extent of infestation. In those counties and parishes where control has been applied to all known areas of infestation the survey crews should be supplied with limited control equipment; and where small incipient infestations are found, treatment should be applied at that time to obviate the necessity of a return visit.

B. Eradication and Control

Present eradication and control measures will be continued. Every effort will be made to step up this phase of the work in order to increase the acreage treated.

C. Regulatory

From a regulatory standpoint, one of our greatest needs is a uniform policy governing treatment of infestations in the environs of establishments dealing in regulated articles. A policy to govern this will be developed during the current year.

D. Methods Improvement

Work to improve the formulation of materials presently used for imported fire ant control will be continued. Tests will be conducted also to determine the practicability of reducing the amount of toxicant used per acre. Other insecticides will be field tested to determine their suitability for use in the Imported Fire Ant Program. The purpose of this work is to increase efficiency, cut the cost of the eradication work, and reduce hazards to other forms of animal life. Cooperation will be continued with Entomology Research of the U. S. Department of Agriculture and certain State Experiment Stations in carrying out the various phases of this program.

E. Associated Activities

The regulatory and control phases of the Imported Fire Ant Program are closely associated with these activities on the White-Fringed Beetle Program. A little closer tie-in between these activities is in order. Every effort will be made during the year to more closely coordinate the activities of these two programs.

SOUTHERN REGION

PLANT PEST CONTROL DIVISION

IMPORTED FIRE ANT

Period: Beginning of Program Through June 30, 1958

Region: Southern

State	Cooperative Eradication Program			By Farmers Exclusive Of Coop Program	Total Acres Treated	Estimate of Acres Remaining to be Treated
	By Aircraft	Other	Total			
Alabama	43,281	19,944	63,225	94,527	157,752	11,207,859
Arkansas	17,222	1,354	18,576	0	18,576	0
Florida	0	6,348	6,348	1,824	8,172	1,443,276
Georgia	93,934	12,425	106,359	0	106,359	143,106
Louisiana	103,794	22,312	126,106	15,349	141,455	4,308,042
Mississippi	0	194	194	5,052	5,246	3,690,270
North Carolina	0	1,567	1,567	0	1,567	0
South Carolina	2,735	2,330	5,065	0	5,065	2,662
Texas	2,568	1,193	3,761	1,600	5,361	742,028
					449,553	
Total	263,534	67,667	331,201	118,352	449,553	21,537,243

IMPORTED FIRE ANT

Period: Beginning of Program Through June 30, 1958

Region: Southern

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South Carolina	2,735	2,330	5,065	0	5,065	2,662
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UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Program Imported Fire Ant

SUMMARY OF ASSOCIATED ACTIVITIES

Prepared by: _____

Region Southern

Fiscal year 1958

Area	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used**				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.*	Infest. Maps & Posters	
Alabama	91	88	14	-	30	6	23	2	1	1	11	3
Florida	24	20	15	-	4	3	270	9	2,000	100	7	3
Georgia	77	39	23	3	53	11	83	4	160	655	19	-
Louisiana	52	30	4	0	7	2	48	0	250	200	9	10
Texas	42	42	25	0	16	8	15	0	200	200	12	6
Total	286	219	81	3	110	30	439	15	2,611	1,156	58	22

*Written by Federal personnel for release direct or through cooperators.
**This should be a conservative estimate (accurate record for these items impractical).

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
CENTRAL REGION

ANNUAL PROGRAM REPORT

JAPANESE BEETLE CONTROL

July 1, 1957 - June 30, 1958

In Cooperation with Other
Federal, State, County, and Local Agencies

November 14, 1958
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

TABLE OF CONTENTS

I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

A. Accomplishment for the fiscal year

Activities for the control of the Japanese beetle were conducted in all states of the Central Region with the exception of Kansas, Nebraska, North Dakota, and South Dakota. Accomplishments in the Central Region included placing 30,108 traps and scouting 3,231 locations. Outside of the treatment in nurseries, 17,572 acres were soil-treated and an estimated 17,852 acres were foliage-sprayed. Regulatory activities involved only the State of Ohio, with Plant Pest Control personnel making 3,543 service calls to 161 shippers for certification purposes.

In Ohio, 104 townships in 11 counties were added to the area under Federal regulation. The entire area now includes approximately the eastern one-third of the State, in addition to parts of Franklin, Lucas, and Richland Counties, which are detached from the main regulated area. Lack of adequate control facilities in the areas adjacent to the regulated area was the prime reason for extending the boundaries.

Efforts to interest growers in treating-out the nurseries in their entirety are gradually bearing fruit. At the close of the fiscal year, a number of establishments have completed this treatment and others have declared intentions of doing so. A total of 922 acres, involving 1,140 plots in 81 nurseries, were soil-treated for certification during the year. Also, approximately 122,000 plants and 3,990 cubic yards of soil were treated with residual chemicals or fumigants. In addition to the work in the regulated areas, soil treatment of 1,252 acres was applied at 8 locations and foliage spray totaling 17,837 gallons of DDT formulation was used. Foliage applications in the generally infested cities of Cincinnati and Chilicothe, Ohio, were done primarily to reduce the hazard of spread.

The program in Kentucky consisted primarily of survey. However, several collection sites in the vicinity of Louisville and communities across the river from Cincinnati were soil-treated. As a result of a report from the county agent in Pike County, and subsequent information obtained locally, a persistent infestation was found involving more than 2,000 acres in the vicinity of Pikeville. Plans are being developed to treat this area by plane in the fall of 1958.

The Michigan program was highlighted by the fact that all but one of the 184 beetles trapped during the year were found in the Detroit area. The single beetle was trapped in Lansing, immediately outside the large infestation treated in 1955. At the end of the trapping season, all areas in the State where beetles were found had been soil-treated.

In Indiana beetles were trapped for the first time in Remington, Garrett, and Kendallville. In each case the beetles were found near railroad yards, which were subsequently treated to a 100-yard radius of the infestation. Soil treatment as a suppressive measure was done on infested farmland at Wenatah, Plymouth, and Argos. Foliage treatment was applied in areas of the heaviest infestation in the Kentland, Indiana, area adjacent to Sheldon, Illinois, and along Highway 24. Several nurseries located within infested areas were also soil-treated.

Four new infestations were discovered in Illinois. These were at Berwyn, Forest View, Stickney, and Monsanto. A total of 130 acres was hand-treated with soil insecticide in Forest View, Stickney, and a previously known infestation in Highland Park. In addition, spot treatments were made in Monsanto, Fairmont City, and Washington Park. Aerial treatments with granular insecticides were made on 4,495 acres in East St. Louis and 8,195 acres in the Sheldon area. In addition, 38 acres in the East St. Louis area were treated by hand seeders.

Activity in Missouri was limited to trapping and visual scouting. A total of 2,000 traps was placed in 1,512 locations throughout the State. Only eight beetles were captured during the year and all of these were in the St. Louis area near the Mississippi River.

The program in Iowa was highlighted by the aerial control treatment of 1,925 acres in Fort Madison, where surveys indicated the beetle was well established. In addition, 75 acres were treated with hand applicators. This is the only area where beetles were found in the State during the year.

Japanese-beetle control activities in Minnesota and Wisconsin were limited almost entirely to trapping at railroad- and truck terminals and major air fields. In the latter State, three single beetles were captured in as many locations. One beetle was caught about 300 yards from the isolated location in Milwaukee that produced a single beetle in 1956 and another about one mile northeast of this point adjacent to a truck terminal. The third beetle was trapped at Sturtevant, Racine County. All three of these sites were soil-treated with 5-percent granular insecticide the same season the beetles were found.

B. Major deviation from work plans

The principal deviation from the previously planned work was the cooperative treating program of the infestations in Sheldon and East St. Louis, Illinois, and the one at Fort Madison, Iowa. This work did not materially require adjustment in the over-all plans but was merely an additional means of approaching the objective of preventing further spread of the beetle.

C. Status of program at close of year

At the close of the year there were an estimated 764,000 acres of beetle-infested territory in the Region outside of the regulated area. In Indiana and Ohio, there were several moderately to heavily infested areas whose boundaries have extended to such proportions that any attempt at full-scale eradication is virtually impossible with current resources and facilities. These areas are at Fort Wayne, Logansport, South Bend, and Indianapolis, Indiana, and Cincinnati and Chilicothe, Ohio.

II. PROGRAM ACTIVITY DURING FISCAL YEAR

A. Planning and direction

The Japanese-beetle control program is a joint effort of the Division and the states involved. The Division, through the resident supervisor, works very closely with State officials in planning and coordinating the over-all field operations. The enforcement of Federal Japanese Quarantine No. 48 is primarily a Division responsibility. Cooperative surveys are a joint operation of the Division and the states.

B. Technical assistance

Frequently Division personnel and employees of the State Department of Agriculture and/or Conservation supervise and provide the technical assistance to golf associations and community groups on procedures for local beetle control. They also appear before garden clubs and civic organizations to discuss the Japanese-beetle program. The Extension Service, through the county agents, is provided with informational and visual-aid material for their program service facilities.

Experiment Stations in the infested states have active beetle research projects. Stations in Ohio, Indiana, and Illinois study many aspects of the ecology, control, damage, and population trends of the beetle. In Ohio, extensive research is conducted with the various insecticides. Station personnel have been very cooperative in discussing results and keeping our people informed of their work. They have been particularly helpful in reporting locations of new infestations.

C. Survey.

The principal method of survey in all states was the extensive use of baited traps. These are used to detect new infestations and to delimit known infested areas. Traps are also placed in areas that were previously treated, to determine effectiveness of the insecticide and for the purpose of detecting reinfestation.

Visual scouting was done in non-regulated areas to determine population densities. This method was also used in regulated areas to determine hazardous conditions in connection with the application of the special summer quarantine regulations. Some scouting is done in nurseries, near greenhouses, and in agricultural areas within the regulated area and adjacent to non-regulated territory.

D. Eradication or control

Control activities during the year were directed toward preventing further spread of the beetle wherever such course of action was practical. Small isolated and spot infestations were soil-treated in Indiana, Illinois, Michigan, Ohio, and Wisconsin. More extensive areas in Illinois and Iowa, totaling 14,615 acres, were treated by plane application. These soil treatments for control but not certification consist of a uniform distribution of a granulated insecticide at the rate of 20 pounds of 10-percent dieldrin. This treatment has given very good control results and, in some instances, complete eradication.

Private property owners, golf-course associations, cities, and towns where the beetles developed in such numbers as to cause vegetative damage, control was effected with DDT applied by hand application or truck-mounted mist blowers. For more lasting control, soil treatment with residual chemicals was used, particularly on golf courses. In localities where the adults were found in such numbers as to cause a hazardous hitch-hiking condition, the foliage treatment was applied. Foliage application only reduces populations and is not effective as a long-range control measure.

E. Regulatory

The Japanese-beetle quarantine is designed to retard the spread of the beetle by regulating the movement of nursery stock, soil, etc., from the regulated area, which is generally infested. The regulated area in the Central Region is confined to a territory consisting of approximately the eastern one-third of Ohio and three small areas in as many counties detached from the main area. Within this area there are 300 establishments involving 4,728 acres that are serviced by Plant Pest Control inspectors.

Articles regulated under the provisions of the quarantine were treated under the direct supervision of a Federal inspector in accordance with methods selected by him from authorized procedures known to be effective under conditions which apply. During the year, the inspectors in the regulated area made 3,543 service calls and certified products valued at nearly $17,000,000. All cost of the certification work, exclusive of the inspectors' service, is assumed by the individual establishments.

In non-regulated areas, where beetles have been found in or adjacent to establishments, movement of stock is restricted by

agreement between the grower and the State Department of Agriculture. Such an agreement has been promulgated in the Cincinnati, Ohio, area. The enforcement of regulations set forth in such agreements are the responsibility of the State. In Illinois and Indiana restricted movement of products is governed by State quarantine regulations.

This year the summer quarantine was modified to take regulatory action on all hazardous commodities capable of spreading infestation. The practice of designating regulated areas and dates in advance was discontinued this year. Instead, the summer regulations applied to all regulated areas during the entire adult-beetle season. However, regulatory action was invoked in local areas only where the inspector determined that a hazard existed. In the Central Region, only one location--Marietta, Ohio--was involved in the summer quarantine. Most of the commodities and transportation means moved east into the regulated area. There was some movement west, principally into Columbus and Cincinnati, but only on a limited scale.

Commodities and vehicles moved without certification under the revised summer quarantine. However, spot checks were made of trucks at certain weigh stations and truck terminals. No beetles were found during the course of these inspections.

F. Methods improvement

A multi-engine aircraft was used for the first time in the Region to apply granular insecticide. The plane was approved by CAA to fly over industrial and residential areas and railroad yards in East St. Louis, Illinois, and Fort Madison, Iowa. It was also used to treat an agricultural area near Sheldon, Illinois.

Two Skibee spreaders were purchased for use in areas too extensive for hand treatment.

The Central Region obtained from the Eastern Region traps, trap parts, and several machines for making parts. During the fiscal year, this Region supplied traps and/or parts to the Southern and Western Regions, as well as to areas within the Region.

III. RECOMMENDATIONS FOR COMING YEAR

A. Survey

To plan an effective Japanese-beetle control program, it is essential to have current knowledge of the prevalence and severity of the pest. Trapping and visual scouting should be increased in this Region to locate possible new areas of infestation and to delimit known areas. Emphasis should be placed on trapping in railroad yards, at truck terminals, and at other similar sites that

offer opportunity for introduction of the beetle. More visual scouting is necessary in order to accomplish an effective summer quarantine program.

B. Eradication or control

The highest priority in control work should be assigned to isolated outlying infestations. More effort should be made to obtain the financial assistance of property owners, golf associations, cities and towns, etc., in treating known areas of infestation. If the states, property owners, and Federal Government are to share in the cost of cooperatively conducted programs, it is recommended that a uniform policy be adopted for the financing of these undertakings.

C. Regulatory

An attempt should be made to simplify certification and regulatory procedures in order to lessen the cost of such work. Increased effort should be made to have more establishments acquire a higher percentage of full-plot certification status.

D. Methods improvement

The effectiveness of low-cost insecticides should be further explored by research workers to decrease the cost of control work. More research work is necessary on the development of spore dust for widescale use in control operations. More research work is also necessary on the treatment of nursery stock for certification to lessen the cost of such work.

E. Associated activities

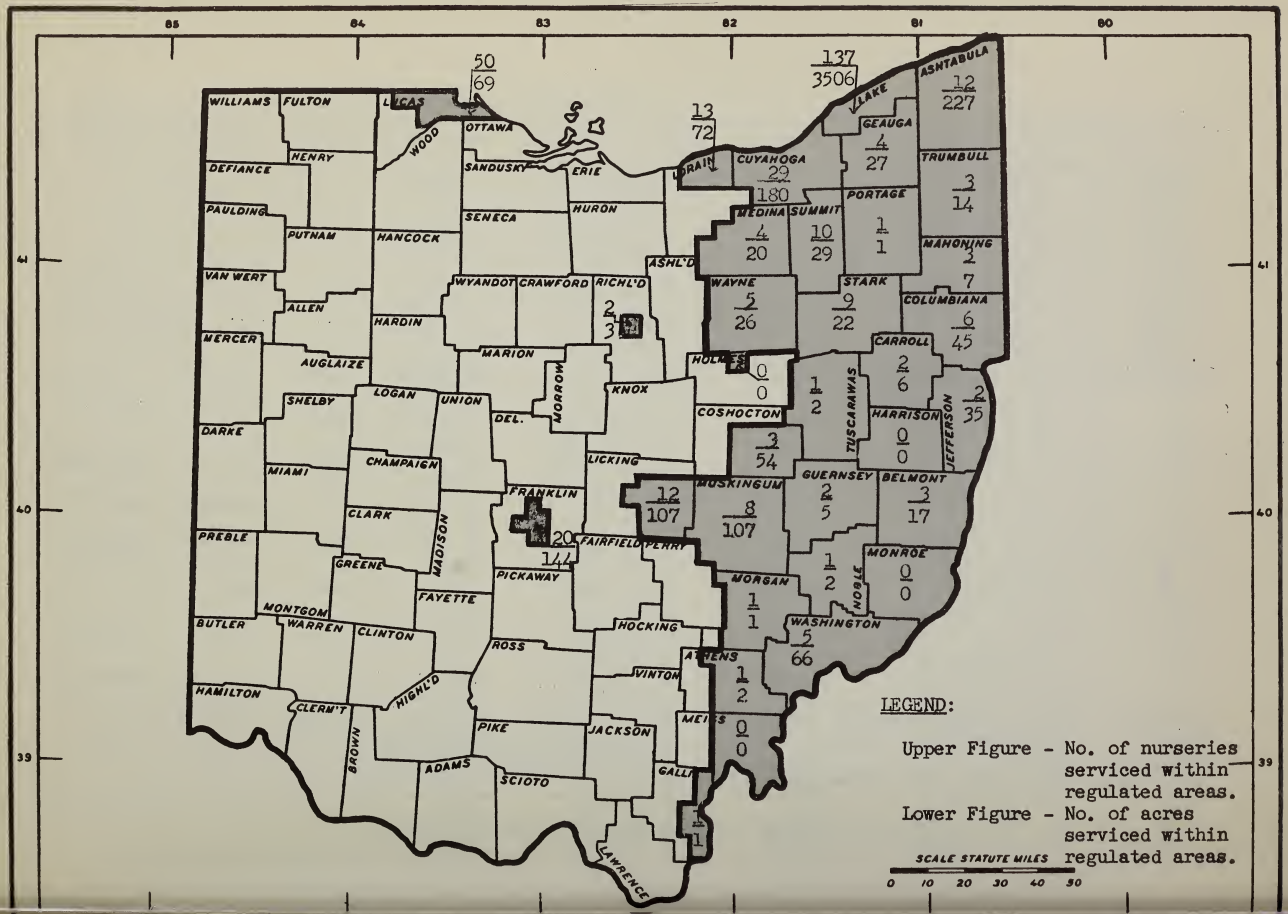
Informational work within each area should be emphasized through meetings, visual aids, newspaper, radio, and television publicity, and other means of visual education.

Japanese Beetle - Accomplishments, Fiscal Year 1958

State	Survey				Control Treatments			Certification Services		
	Traps in Use*	Locations Scouted	Acres New Infestations Regulated Area	Acres New Infestations Non-regulated Area	Nursery (Acres)	Soil (Acres)	Foliage (Acres)	Shippers Serviced	Total Service Calls	Est. Value Products Certified
Illinois	6,154	82	0	130	0	12,858	0	0	0	0
Indiana	4,437	27	0	17	109	276	15	0	0	0
Iowa	975	123	0	1,280	0	2,000	0	0	0	0
Kentucky	1,904	83	0	2,000	0	852	0	0	0	0
Michigan	8,581	34	0	0	0	329	0	0	0	0
Minnesota	262	28	0	0	0	0	0	0	0	0
Missouri	2,000	1,512	0	0	0	0	0	0	0	0
Ohio	5,181	1,266	1,681,920	0	922	1,252	17,837	161	3,543	16,860,066
South Dakota	4	2	0	0	0	0	0	0	0	0
Wisconsin	610	74	0	5	0	5	0	0	0	0
Totals	30,108	3,231	1,681,920	3,432	1,031	17,572	17,852	161	3,543	16,860,066

*Number of traps out during peak month of fiscal year.

JAPANESE BEETLE CERTIFICATION - OHIO - FISCAL YEAR 1958



LEGEND:

Upper Figure - No. of nurseries serviced within regulated areas.

Lower Figure - No. of acres serviced within regulated areas.

SCALE STATUTE MILES

0 10 20 30 40 50

Japanese Beetle - Summary of Associated Activities - Fiscal Year 1958

State	Public Meetings Attended	Presentations: Talks	Presentations: Slides	Presentations: Films	Presentations: Radio	Presentations: TV	Feature & News Stories*	Extent These Aids Were Used**: Exhibits	Extent These Aids Were Used**: Bulletins*	Extent These Aids Were Used**: Circulars*	Extent These Aids Were Used**: Infest. Maps & Posters	Other
FEDERAL												
Illinois	2	2	1	-	-	-	-	-	5	6	-	-
Iowa	2	2	-	-	1	-	3	-	10	5,600	30	1
Kentucky	7	3	-	-	-	-	-	-	-	-	-	-
Michigan	-	2	1	2	-	-	-	-	550	-	-	640***
Missouri	-	1	1	-	-	-	-	-	25	-	-	1
Ohio	4	2	-	8	1	1	-	3	2,500	-	745	92***
Wisconsin	-	-	-	-	-	-	-	-	20	-	125	-
Totals	15	12	3	10	2	1	3	3	3,110	5,606	900	734
COOPERATORS												
Illinois	-	-	-	-	-	-	2	-	-	-	-	-
Indiana	-	-	-	-	-	-	1	-	-	-	-	-
Iowa	1	1	-	-	-	-	-	-	-	-	-	-
Kentucky	7	-	-	-	-	-	-	-	-	-	-	-
Michigan	-	6	-	1	4	1	4	-	-	-	-	-
Missouri	-	-	-	3	-	-	-	-	-	-	-	-
Ohio	4	2	-	-	-	-	-	-	-	-	-	-
Totals	12	9	-	4	4	1	7	-	-	-	-	-
GRAND TOTALS	27	21	3	14	6	2	10	3	3,110	5,606	900	734

*Written by Federal personnel for release direct or through cooperators.
**Conservative estimate.
***640 and 88 newsletters (annual), respectively.

Japanese Beetle - Cooperative Aid Received, Fiscal Year 1958

State	Cash or Equivalent Aid*				Total of Cash & Equiv.*	Intangible Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Illinois	$ 57,375	$11,694	$ 0	$ 0	$ 69,069	$ 1,500	$ 70,569
Indiana	2,500	18,727	50	120	21,397	1,200	22,597
Iowa	0	1,200	9,340	170	10,710	700	11,410
Kentucky	13,950	1,500	350	0	15,800	4,250	20,050
Michigan	13,474	0	0	0	13,474	6,500	19,974
Minnesota	0	25	0	0	25	1,800	1,825
Missouri	0	2,500	200	410	3,110	1,350	4,460
Ohio	43,146	6,600	2,115	0	51,861	11,950	63,811
Wisconsin	0	172	81	0	253	2,000	2,253
Totals	$130,445	$42,418	$12,136	$700	$185,699	$31,250	$216,949

*Limited to direct appropriation, allotments from other sources, services, and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available.

Japanese Beetle - Expenditures by Source and by Activity, Fiscal Year 1958

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
CASH & EQUIVALENT*								
PPC Division	$13,275	$ 2,550	$50,906	$ 23,814	$34,750	$700	$1,500	$127,495
Other Organizations:								
Illinois	2,000	0	5,194	61,375	500	0	0	69,069
Indiana	2,000	0	14,802	4,595	0	0	0	21,397
Iowa	400	0	605	9,595	0	0	110	10,710
Kentucky	500	1,000	3,500	10,200	250	0	350	15,800
Michigan	1,500	1,000	7,474	3,500	0	0	0	13,474
Minnesota	0	0	25	0	0	0	0	25
Missouri	200	100	2,400	0	0	0	410	3,110
Ohio	2,000	0	5,000	34,500	7,261	0	3,100	51,861
Wisconsin	0	0	125	128	0	0	0	253
Subtotals	$ 8,600	$ 2,100	$39,125	$123,893	$ 8,011	0	$3,970	$185,699
CONTRIBUTED SERVICES**								
Illinois	0	1,000	0	0	0	0	500	1,500
Indiana	0	1,000	0	0	0	0	200	1,200
Iowa	0	400	0	0	300	0	0	700
Kentucky	0	2,000	600	0	1,250	0	400	4,250
Michigan	0	0	3,500	0	3,000	0	0	6,500
Minnesota	300	0	1,500	0	0	0	0	1,800
Missouri	0	450	0	0	800	0	100	1,350
Ohio	1,500	7,500	2,750	0	0	0	200	11,950
Wisconsin	0	1,500	0	0	500	0	0	2,000
Subtotals	$ 1,800	$13,850	$ 8,350	0	$ 5,850	0	$ 1,400	$31,250
GRAND TOTALS	$23,675	$18,500	$98,381	$147,707	$48,611	$700	$6,870	$344,444

*Limited to direct appropriation, allotments from other sources, services, and supplies for which there is actual cash expenditure. **Services incidental to other activities - only estimated value available.

(* - - *)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

JAPANESE BEETLE

July 1, 1957 - June 30, 1958

COOPERATING AGENCIES:

State Plant Pest Control Agencies
Experiment Stations, Extension Service
and
Plant Pest Control Division, Entomology Research Division
of the
Agricultural Research Service
U. S. Department of Agriculture

November 1958
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

TABLE OF CONTENTS

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

Cooperative survey was expanded in the nonregulated sections of the six partially regulated quarantined States and control treatments were applied when necessary. There was substantial extension of regulated areas in Virginia and West Virginia.

Moderate changes made in the 1957 seasonal quarantine operations proved to be practicable and the operational experience was valuable in planning an improved program for 1958. This began in June and provides for increased effectiveness through more flexibility in selecting compliance methods consistent with local infestations and related hazards of pest spread. Progress was made in training the integrated field force to concentrate on locating hazardous infestations, arranging appropriate cooperative suppression treatments and prescribing other needed regulatory procedures involving maximum effectiveness with minimum inspection services.

B. Major deviation from Work Plan

None

C. Status of Program at close of year

The major regional activity is related to the certified movement of soil and plants during the entire year. This part of the program is relatively stable. However, the summer seasonal quarantine is subject to changes in adult beetle population, and methods of crop production, handling, marketing and transportation. After considering these fundamental factors and the experience of the 1957 transitional period, the Division issued 1958 seasonal quarantine requirements considerably changed from those formerly in effect, and designed for improved effectiveness.

II. Program Activity During Fiscal Year

A. Planning and Direction

1. How planned and directed

General planning and direction was by the Regional Supervisor assisted by the staff and Plant Pest Control Supervisors in charge. State Cooperators participated as outlined in cooperative agreements. Policy matters were discussed with the

Division Chief and Staff. Research associates were important participants in planning and regulated industry was also consulted. Direct field operational planning with State cooperators was the function of the Plant Pest Control Supervisors.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Since the major part of the program activities relates to regulatory operations, program personnel came in contact mostly with those affected by the quarantine regulations. This was an important function, especially since there is no single method of quarantine compliance applicable to the considerable number and variety of commercial establishments affected. The inspectors had information from the official Department Farmers' Bulletin for answering inquiries from the general public about control of the adult beetle and the grubs in turf.

2. Technical assistance provided to program by cooperating agencies

There was a considerable amount of technical assistance in survey, control and regulatory work by various units of the Entomology Research Division, State Experiment Research associates, and all Sections of the Division office. The Department's Information Section assisted in preparation of quarantine maps. Also, there was service in insect identification. Plant Quarantine Division prepared lists of localities under regulation for use by inspectors and shippers to determine need for certification.

C. Survey

1. Procedures or techniques used

a. Field

Program and cooperating State field forces used traps and visual observation for detection and delimiting surveys in non-regulated areas. Illustrated literature, plastic mounts, and the new Department movie were used to alert the general public to the possibility of beetle occurences and direct their reports of observations to

State pest control officials and County Agents. Within regulated areas, surveys to determine abundance and distribution of the beetle was entirely for regulatory purposes. These field observations were made by local inspectors at nurseries, produce packing sheds and other sites directly related to the movement of regulated products.

b. Laboratory

None

2. Accomplishments - See Table #1

As a result of cumulative survey information, all or parts of six Virginia counties and all or parts of 23 West Virginia counties were added to the Federal regulated areas in May 1958. There were some scattered beetle finds in the non-regulated parts of the quarantined states. Treatments were applied where necessary. At other sites, continued survey is planned to determine developments.

3. Statement or table of pest damage

There is no change in the previous estimated total damage, but a large part of this estimated $10,000,000 annually, occurs in this Region. During 1957, in the regulated areas affected by the drought, the adult beetle disappeared early and there are indications of greatly reduced populations in 1958. Population densities elsewhere were somewhat lower generally than in 1956, except in scattered spots of heavy infestation. Farmers in some sections applied repeat foliage treatments to protect corn from beetle damage during "silking". Otherwise, special treatments to protect farm crops were not generally used. Complaints about beetle damage were mostly from residential areas.

D. Eradication or Control

1. Procedures or techniques used

Both foliage sprays and surface soil treatments were recommended for control or eradication in non-regulated isolated infestations. DDT mist blower spray was the insecticide most commonly used for foliage treatments. Residual insecticides, in granular form, applied by ground power machines and by hand applicators were used in cooperative soil treatments where necessary. Most of these treatments were with dieldrin at 2 to 3 pounds per acre.

2. Refer to Table #1

E. Regulatory

1. Procedures or techniques used

Regulatory activities were carried on in all parts of the Region throughout the year and most Regional employees participated to some extent. Regulatory action was based on the local inspector's knowledge of current infestation and the related hazards of moving hosts or infestible articles therefrom to non-regulated destinations. Certification through actual inspection, application of a variety of treatments, or through other approved procedures, made at shipping time or applied in advance during production was provided to shippers concerned. Standard certificates in printed paper or stamp form were available.

Suitable maps showing the regulated areas and containing summary statements about the quarantine were distributed to those concerned with the movement of regulated articles. The Post Office Department cooperated by distributing maps and instructing clerks to inform the public of quarantine requirements and the need for certificates.

2. See Table #1

F. Methods Improvement

1. Work Performed

All operating personnel were instructed to be alert for possible methods improvements. Suggestions were discussed with various technical associates in the Division, Entomology Research Division, and State agencies.

2. The principal development during the year was the issuance of a revised manual of approved treatment procedures issued April 16, 1958. Work is continuing on associate manuals relating to methods and equipment.

G. Other

1. Cooperation received during fiscal year

a. The Post Office Department distributed to all of its local offices a map of the regulated area and ordered that it be posted at all parcel post receiving sites. That Department also printed a summary of the Federal quarantine requirements in its Bulletin to employees. Military and civilian airport officials furnished quantities of insecticide for cooperative suppressive treatments at infested airfields.

b. Cooperative work needing strengthening another year

Presently available funds are not adequate to render the desired amount of regulatory service to affected industries. Certain States make little contribution to this program, responsibilities to their affected industries notwithstanding. Review of this situation with Plant Boards concerned is recommended.

Extension and informational agencies could render additional assistance to the program by increasing assistance in the distribution of quarantine and control information to the general public through media available to them.

2. Associated activities and services

a. Program servicing

(1) The new Japanese beetle film has been effective in informing people within the regulated areas about the need to cooperate by not moving infested materials to non-regulated areas. The new maps distributed by the Post Office Department to its regulated offices and by inspectors generally were very helpful. There was more interest by the integrated field force in distributing illustrated material and talking to garden clubs and other groups about this program. County Agents were kept more fully informed about the program activities than formerly. All of these informational outlets and procedures are essential to effective conduct of the program.

III. Recommendations for Coming Year

A. Survey

Expand surveys in non-regulated areas in the Eastern Region.

B. Eradication or Control

Apply timely foliage and soil treatments at isolated infestations where such action is feasible.

C. Regulatory

Continue training program with integrated supervisory and inspection forces in principles of regulatory action to acquaint them with appropriate techniques and procedures.

Expand application of advance treatments of regulated articles to

reduce necessity for scheduled inspection calls and small order treatments or inspections.

Continue cooperative regulatory treatments to suppress adult beetles at airfields and other sites concerned with movement of articles and carriers to non-infested destinations.

Devise standard limited permit and standard document for notifying custodians of hazardous products or carriers.

D. Methods Improvement

Ascertain effectiveness of foliage treatments with mist blowers at airports and other common carrier sites.

Take photos of field operations and complete field operations procedural film.

Review with research associates value of aerosols and residual treatments for airplanes and certain possible improvements in authorized treatments.

E. Associated Activities

Information about program should be sent to Trade papers of affected industries when there are new developments or improvements.

SUMMARY OF REGIONAL ACTIVITY

Table 1

Eastern Region

Fiscal Year 1958

State A	SURVEY				CONTROL TREATMENTS			CERTIFICATION SERVICES		
			Acres of New Infestations			All Other				
	Traps In Use B	Locations Scouted C	Regulated Area D	Non-Regulated Area E	Nursery (Acres) F	Soil (Acres) G	Foliage (Acres) H	Shippers Serviced I	Total Service Calls J	Est. Value Products Certified K
Connecticut	-	-	-	-	-	-	-	-	1,614	854,856
Delaware	-	46	-	-	-	-	-	-	749	721.118
Maine	-	19	-	-	-	23.58	-	-	395	57,274
Maryland	-	57	-	-	-	-	620	-	1,494	680,388
Massachusetts	-	-	-	-	-	-	-	-	1,344	278,922
New Hampshire	-	-	-	-	-	-	25	-	266	54,577
New Jersey	-	-	-	-	-	-	-	-	3,491	1,833,311
New York	-	159	-	13	-	13.00	-	-	2,671	2,703,366
Pennsylvania	-	-	-	-	-	-	-	-	3,280	1,917,130
Rhode Island	-	-	-	-	-	-	-	-	554	310,233
Vermont	-	-	-	-	-	12.58	-	-	322	16,768
Virginia	-	964	-	15	-	-	1,276	-	1,299	910,838
W. Virginia	-	256	-	-	-	-	608	-	318	390,815
Dist. Col.	-	-	-	-	-	150.00	75	-	63	3,353
Total from 7/1 to 6/30/58		1501	-	28	-	199.16	2,604	-	17,860	10,812,949
Total from Beginning of Program			xx	xx	xx	xx	xx		xx	xx

PPC 7-9

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

JAPANESE BEETLE

July 1, 1957 - June 30, 1958

In cooperation with other
Federal, State, County, and Local Agencies

November 15, 1958
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

Surveys for the Japanese beetle were made in more than 200 counties of Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas. New infestations were found on 160,211 acres. Known infested states in the Southern Region are Georgia, North Carolina, South Carolina, and Tennessee.

B. Major Deviation from Work Plan

None

C. Status of Program at close of year

Japanese beetle infestations are known to exist in 87 counties of the 4 states known to be infested and vary in population density from large heavily infested areas of counties in the eastern coastal sections in North Carolina to light, scattered infestations in the western mountain section of that state, the eastern counties of Tennessee, and several counties of South Carolina and Georgia.

II. Program Activity during fiscal year

A. Planning and Direction

1. How planned and directed

The program is planned and directed jointly by the Plant Pest Control Division and the cooperating state plant pest control agencies. The Division assumes the major responsibility for field direction of survey and control; while direction of quarantine work is jointly shared. The program is reviewed periodically for strengthening where necessary.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Program personnel assists farmers, nurserymen, and others in complying with quarantine requirements as procedures are developed to allow the movement of regulated articles into normal trade channels with a minimum of expense and inconvenience.

2. Technical assistance provided to program by cooperating agencies

The Extension Service in each state has been active in disseminating information on the Japanese beetle, particularly to home owners concerned with controlling beetles that damage ornamentals and lawns.

C. Survey

1. Procedures or techniques used.

Traps were mainly relied on in Japanese beetle surveys to locate and delimit new infestations, to indicate control needs, and to measure population densities. These traps were placed in strategic locations, such as fresh produce markets, airports, trucking centers, nurseries, and other points most likely to be exposed to infestation by "hitchhiking" beetles.

2. Accomplishments

Japanese beetle surveys were made on 1,673 locations in 210 counties of 10 states in the Southern Region. New infestations were found on 160,211 acres, which involved three new counties in Georgia and several extensions to infestations in many other counties in Georgia, North Carolina, South Carolina, and Tennessee.

3. Statement or table of pest damage

The root-feeding grub destroys grass in pastures, lawns, and golf courses; and the adults feed on leaves of grapes, peaches, apples, and many other farm and ornamental crops.

D. Eradication or Control

1. Procedures or techniques used

Foliage sprays were applied to all areas where beetle populations were developing to a hazardous level.

2. Accomplishments

In the Carolinas all military air installations and some commercial airports were sprayed. Sprays were applied, also, to approximately 45 acres of nursery land. Foliage sprays were applied to 721 acres, and soil treatments were made to 3,782 acres.

E. Regulatory

1. Procedures or techniques used

Many nurserymen are now using approved soil treatment methods to meet certification requirements, but the individual plant treatment method for certification is continued in all cases until the entire nursery has been treated.

2. Accomplishments

Certification services included 2,189 service calls, with the value of the products certified estimated at $9,232,185.

F. Methods Improvement

None.

III. Recommendations for coming year

A. Survey

Trapping and visual scouting should be intensified in nonregulated counties. Special surveys should be made in the regulated areas at airports, trucking centers, and other areas to determine if hazardous populations exist. Surveys of nurseries not known to be infested should be continued to guide regulatory action.

B. Eradication or Control

Control operations should be maintained at airports and fresh fruit and vegetable produce markets where such produce is shipped outside regulated areas. It is also recommended that small isolated infestations be completely treated when such infestations present a hazard of further spread.

C. Regulatory

None

D. Methods Improvement

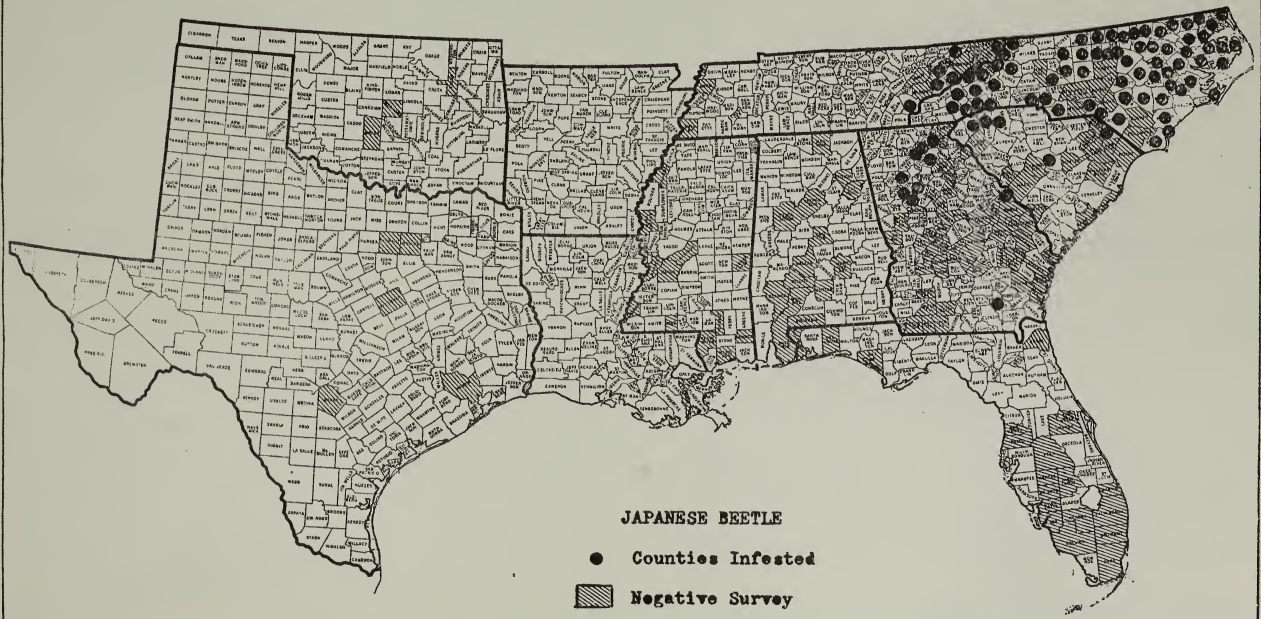
It is recommended that an increased effort be made to find or develop a less expensive method of eradicating this pest, which will make it feasible to initiate such a program, particularly in the outlying infestations.

E. Associated Activities

It is recommended that a special effort be made to acquaint the general public, nurserymen, florists, general farm operators, shipping companies, and others of the seriousness of this pest in order that proper measures may be taken to eradicate incipient infestations and to encourage control in generally infested areas.

SOUTHERN REGION

PLANT PEST CONTROL DIVISION



JAPANESE BEETLE

Region: Southern

Prepared by:

Period (Designate: Month, 1-15, 16-31, or 1-31): Fiscal Year 1958

Date prepared:

STATE AND COUNTY A	SURVEY: Traps* In Use B	SURVEY: Locations Scouted C	SURVEY: Acres of New Infestations: Regulated Area D	SURVEY: Acres of New Infestations: Non-Regulated Area E	CONTROL TREATMENTS: Nursery (Acres) F	CONTROL TREATMENTS: All Other: Soil (Acres) G	CONTROL TREATMENTS: All Other: Foliage (Acres) H	CERTIFICATION SERVICES: Shippers Serviced I	CERTIFICATION SERVICES: Total Service Calls J	CERTIFICATION SERVICES: Est. Value Products Certified K
Alabama	139	496		0						
Florida	165			0						
Georgia	964	362		159,655						
Louisiana	17			0						
Mississippi	51	39		0						
North Carolina	180	190		40	13	3,566	721	83	2,167	$ 9,218,920
Oklahoma	47	4		0						
South Carolina	174	313		6	32	23		2	22	13,265
Tennessee	140	237		510		193				
Texas	39	32		0						
Total This Period	1,916	1,673		160,211	45	3,782	721	85	2,189	$ 9,232,185
Total From July 1										
Total from Beginning of Program										

* Maximum number in any one month.

PPC 7-9
(Mar.-58)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Program Japanese Beetle

SUMMARY OF ASSOCIATED ACTIVITIES

Prepared by: _____

Region Southern

Fiscal year 1958

Area	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used**				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.*	Infest. Maps & Posters	
Florida	-	-	-	-	-	-	13	-	-	-	-	-
Georgia	-	-	2	2	-	-	4	-	100	-	-	1
Total												

*Written by Federal personnel for release direct or through cooperators.
**This should be a conservative estimate (accurate record for these items impractical).

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
CENTRAL REGION

ANNUAL PROGRAM REPORT

KHAPRA BEETLE SURVEY

July 1, 1957 - June 30, 1958

In Cooperation with Other
Federal, State, County, and Local Agencies

November 14, 1958
Minneapolis, Minn.

R. O. Bulger
Regional Supervisor

TABLE OF CONTENTS

I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

A. Accomplishment for the fiscal year

Accomplishments for the year consisted of inspecting a number of grain- and seed-handling establishments in the states of Indiana, Kansas, Minnesota, Missouri, Nebraska, South Dakota, and Wisconsin, of which 156 were initial and 24 repeat inspections. Of the 165 beetle specimens collected for identification, none were identified as Trogoderma granarium, the khapra beetle.

B. Major deviation from work plan

During November 1957, a specimen of dermestid from Odell, Nebraska, was identified as a typical form of T. glabrum. Considering that this form may have arisen from a cross between T. glabrum and T. granarium, it was decided to make an intensive survey in the Odell area.

Division and State personnel checked 12 feed mills and elevators in nine towns in this area. They also inspected six Agricultural Stabilization and Conservation bin sites, involving more than 200 bins and quonsets. In addition, 57 individual farms were inspected. Dermestid specimens totaling 140 were sent in for identification, but none were identified as T. granarium.

C. Status of program at close of year

No khapra beetles have been found to date in the Central Region. From the beginning of the program to June 30, 1958, a total of 1,909 initial and 332 repeat inspections have been made in this Region. Area supervisors will continue to inspect for this pest as funds, time, and personnel permit. The premises of grain and seed dealers handling grain, feed products, and other possible carriers of the beetle shipped from the infested states will continue to receive priority by our inspectors.

II. PROGRAM ACTIVITY DURING FISCAL YEAR

The activities during this year have met the long-time objective of the program. Division and State personnel are keeping on the alert for this pest through survey work. Appropriate control and eradication steps against this insect will be taken if found in the Region.

All beetle specimens collected by Division and State inspectors for identification have been mailed to Dr. P. W. Oman, Entomology Research Division, Plant Industry Station, Beltsville, Maryland.

It is the responsibility of the Division to train inspectors for this work. Published information concerning this pest is furnished to the public by the Division and cooperating State agencies.

III. RECOMMENDATIONS FOR COMING YEAR

Survey for the khapra beetle will be continued in the Central Region until all grain and feed-handling establishments that may be harboring khapra beetle have been inspected.

Reinspections will be made of establishments only when information is obtained indicating they may have received contaminated grains, feeds, or other carriers.

Khapra Beetle - Accomplishments During Fiscal Year 1958

State	Inspections			Specimen Collections for Ident.	Infested Sites F.Y.	Total Sites Infested	Sites to be Treated	Est. Current Infested Vol. (Cu. Ft.)	Total Vol. Infested from Beginning	Total Infested Vol. to be Treated
	Initial	Repeat	Total							
Indiana	1	0	1	1	-	-	-	-	-	-
Kansas	1	0	1	-	-	-	-	-	-	-
Minnesota	28	1	29	16	-	-	-	-	-	-
Nebraska	76	-	76	140	-	-	-	-	-	-
South Dakota	3	-	3	3	-	-	-	-	-	-
Wisconsin	12	23	35	5	-	-	-	-	-	-
Missouri	35	-	35	-	-	-	-	-	-	-
Totals	156	24	180	165	-	-	-	-	-	-

Khapra Beetle - Summary of Associated Activities - Fiscal Year 1958

State	Public Meetings Attended	Presentations: Talks	Presentations: Slides	Presentations: Films	Presentations: Radio	Presentations: TV	Feature & News Stories*	Extent These Aids Were Used**: Exhibits	Bulletins*	Circulars*	Infest. Maps & Posters	Other
FEDERAL:												
Minnesota	1	1	1	-	-	-	-	-	-	-	-	-
Missouri	1	1	1	-	-	-	-	-	-	-	-	-
North Dakota	-	-	-	-	-	-	-	-	10	-	-	-
Ohio	-	1	-	-	-	-	-	-	-	-	-	-
South Dakota	3	3	3	-	-	-	-	-	-	15	-	-
Wisconsin	-	-	-	-	-	-	-	-	-	5	-	-
Subtotals	5	6	5	-	-	-	-	-	10	20	-	-
COOPERATORS:												
North Dakota	1	1	1	-	-	-	-	-	-	-	-	-
Ohio	-	1	-	-	-	-	-	-	-	-	-	-
Subtotals	1	2	1	-	-	-	-	-	-	-	-	-
GRAND TOTALS	6	8	6	-	-	-	-	-	10	20	-	-

*Written by Federal personnel for release direct or through cooperators.
**This is a conservative estimate.

Khapra Beetle - Cooperative Aid Received - Fiscal Year 1958

State	Cash and Equivalent Aid*				Total of Cash & Equiv.*	Intangible Service Estimate**	Source Grand Total
	Cash	Personal Services	Equipment & Supplies	Space			
Indiana	25	0	0	0	25	0	25
Kansas	0	0	0	0	0	700	700
Minnesota	0	35	0	0	35	100	135
Missouri	0	750	0	0	750	200	950
Nebraska	0	0	0	0	0	700	700
Wisconsin	0	0	0	0	0	700	700
Totals	25	785	0	0	810	2,400	3,210

*Limited to direct appropriation, allotments from other sources, services, and supplies for which there is an actual cash expenditure.

**Limited to services incidental to other activities for which only an estimated value is available.

Khapra Beetle - Expenditures by Source and by Activity, Fiscal Year 1958

State	Planning & Direction	Technical Assistance	Survey	Control	Regulatory	Methods Improvement	Other	Total
CASH & EQUIVALENT*								
Plant Pest Control Division	$230	$ 75	$2,100	0	$ 0	0	90	$2,495
Other Organizations:								
Indiana	0	0	25	0	0	0	0	25
Minnesota	0	0	35	0	0	0	0	35
Missouri	100	0	650	0	0	0	0	750
Subtotals	$100	0	$710	0	0	0	0	$810
CONTRIBUTED SERVICES**								
Kansas	0	0	700	0	0	0	0	700
Minnesota	100	0	0	0	0	0	0	100
Missouri	0	200	0	0	0	0	0	200
Nebraska	0	0	700	0	0	0	0	700
Wisconsin	0	200	300	0	200	0	0	700
Subtotals	$100	$400	$1,700	0	$200	0	0	$2,400
GRAND TOTALS	$430	$475	$4,510	0	$200	0	$90	$5,705

*Direct appropriation, allotments other sources, services, and supplies for which there is an actual cash expenditure.

**Services incidental to other activities, for which only an estimated value is available.

(* - - *)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
EASTERN REGION

ANNUAL PROGRAM REPORT

KHAPRA BEETLE

July 1, 1957 - June 30, 1958

COOPERATING AGENCIES:

State Plant Pest Control Agencies
and Extension Service
and
Plant Pest Control Division
Agricultural Research Service
U. S. Department of Agriculture

November 1958
Moorestown, New Jersey

H. L. Smith
Regional Supervisor

TABLE OF CONTENTS

I. Highlights of Year's Program Activity

A. Accomplishment for the fiscal year

Khapra beetle surveys were conducted in most states in the Region. Inspections were made at grain mills, grain elevators, breweries, in railroad box cars and in seed and feed establishments which handle a large volume of stored grain products. Particular attention was given to establishments receiving shipments from the Southwest. During the year 182 establishments were initially inspected and 169 were reinspected. As a result, 112 suspect specimens were collected and submitted for determination. (Table #1)

B. Major deviation from work plan

Not Applicable

C. Status of program at close of year

In Virginia, West Virginia, and New Jersey all important grain handling establishments have received an initial inspection, and in the latter State many reinspections have been made. In other States numerous sites remain to be inspected. To date, no infestation has been found in this Region.

II. Program Activity During Fiscal Year

A. Planning and Direction

In most States survey plans were developed and directed jointly by PPC Station Supervisors and cooperating state officials.

B. Technical Assistance

1. Information on the insect was furnished to industries concerned and others. USDA leaflet #PA 261 was useful in disseminating information.

2. Cooperating plant pest control officials, other state agencies, county agents and dealers associations provided lists of grain handling establishments. Specimen determinations were made by the Entomology Research Division.

C. Survey

1. Operators of grain handling establishments were contacted, informed of the insect and its damage potential, and queried as to insect infestation or damage noted in grain. Premises and contents were inspected. Specimens resembling the khapra beetle were submitted for identification. Most inspections

were made during the winter months and many were made incidental to other duties.

2. Specimen determinations were made at the Entomology Research laboratory, Beltsville, Maryland.

3. Not Applicable

D. Eradication or Control

Not Applicable

E. Regulatory

Not Applicable

F. Methods Improvement

Not Applicable

G. Other

1. Cooperation received

Excellent cooperation was extended by State and County cooperating personnel. Some state agencies furnished the services of inspectors and vehicles to assist. Owners of various storage and processing plants cooperated fully and showed an active interest in the work.

2. Associated activities and services

USDA leaflet #PA 261, talks, and slides were used to disseminate information to interested individuals and groups.

III. Recommendations for Coming Year

A. Survey

Extend inspections to include establishments not previously inspected and continue reinspections.

B. Eradication or Control

Not Applicable

C. Regulatory

Not Applicable

D. Methods Improvement

Not Applicable

E. Associated Activities

Expand dissemination of information on this insect.

TABLE 1

KHAPRA BEETLE INSPECTION SUMMARY

EASTERN REGION FISCAL YEAR 1958

STATE	INSPECTIONS			SPECIMEN COLLECTIONS SUBMITTED FOR IDENTIFICATION	INFESTED SITES THIS PERIOD
	INITIAL	REPEAT	TOTAL		
Connecticut	-	-	-	-	-
Delaware	-	-	-	-	-
Maine	-	-	-	-	-
Maryland	31	1	32	-	-
Massachusetts	21	0	21	-	-
New Hampshire	-	-	-	-	-
New Jersey	11	144	155	20	-
New York	-	-	-	-	-
Pennsylvania	27	5	32	19	-
Rhode Island	1	0	1	-	-
Vermont	-	-	-	-	-
Virginia	55	-	55	65	-
West Virginia	36	-	36	8	-
Total	182	150	332	112	-
Total from Beginning of Program	777	169	946	621	-

PPC Form 7-18

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
MEXICO REGION FOR COOPERATIVE PROGRAMS

ANNUAL PROGRAM REPORT

KHAPRA BEETLE PROGRAM

July 1, 1957 - June 30, 1958

In cooperation with

MEXICAN DEFENSA AGRICOLA

November 10, 1958
Monterrey, N. L., Mexico

W. K. Cloré
Regional Supervisor

I. HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITIES

A. Accomplishments

Three Category One fumigations were accomplished in July 1957 which completed the fumigation of all known infested properties in Mexico. Khapra beetle surveys in the Western Area were conducted in the states of Baja California and Sonora during the fiscal year and in November 1957 disclosed a reinfestation at Mexicali, B.C., of a property which had been treated approximately one year before. Another reinfestation was found and 25 newly infested properties, all in the Mexicali zone. This necessitated the requesting of additional funds for eradication and control. By June 30, 1958 23 infested properties had been given an eradication fumigation treatment and the remaining four were scheduled for treatment the early part of July. As soon as a property was found infested with khapra beetle, it was immediately placed under quarantine under the authority of Mexico Khapra Beetle Quarantine #10 which restricts the movement of all commodities until after the property is given an eradication treatment.

B. Major Deviation from Work Plan

The major deviation from the work plan was the inclusion of eradication and control. Surveys were intensified and the importance stressed to distributors and growers of complying with control measures.

C. Status of Program at Close of Year

By the close of the year, for inspection purposes properties had been divided into two general categories, namely, distributors and nondistributors or consumers. Distributors include wholesalers, jobbers, and stores handling host material; nondistributors or consumers include feed lots, ranches, and some dwellings. Surveys were being conducted in the State of Sonora limited to properties of the first category, consisting principally of flour mills and wheat storage warehouses, with negative results. In the Mexicali zone distributor properties were inspected one or more times and most of those listed as consumer properties were inspected once. Of the infested properties found, all but four had been given an eradication treatment.

II. PROGRAM ACTIVITY DURING FISCAL YEAR

A. Planning and Direction

The Chief of the Northwest Protective Zone of the Mexican Defensa Agricola and the PPC Area Supervisor and assistant of the Western Area hold meetings as warranted and plan together the various program activities, such as surveys, eradication efforts, and the enforcement of quarantine regulations. The Western Area is divided into districts and the different phases of the work program are under the direction of the district supervisor in cooperation with the local delegado of Defensa

II. PROGRAM ACTIVITY DURING FISCAL YEAR - Continued

A. Concluded

Agricola. The district supervisors make periodic written reports to the Area Supervisor. Through visitations, discussions and correspondence among the Area Supervisor, his assistant and the district supervisors, the program objectives are executed as planned within the limitations of available funds and assignments of personnel.

B. Technical Assistance

1. Technical Assistance Provided to Farmers and Others by Program Personnel (Not applicable)

2. Technical Assistance Provided to Program by Cooperating Agencies

The fumigation treatments of infested properties in the eradication effort are done in accordance with the procedures developed through research conducted by Agricultural Marketing Service and the California and Arizona Experiment Stations.

C. Survey

1. Procedure or Techniques Used

a. Field. The two properties classified as reinfested were both flour mills and it is thought the reinfestations were brought about through infested used sacks that were filled with wheat and used as bulkheads in the outside storage of grain at the larger of the mills and transported from it to the other mill through the interchange of commodities, principally wheat. Surveys were made for the purpose of detecting khapra beetle infestations and to delimit the infestations found. After the properties are treated, they are again inspected at 90-day intervals for a period of one year to determine if eradication has been accomplished. Because of the habit of the insect to seek cover in tight places such as cracks, holes, cardboard cartons, sacks, etc., inspections are time-consuming and tedious and must be done carefully. Traps made of burlap bags, cloth, and cardboard, were placed in a number of grain storage places and examined periodically, but so far have proved ineffective as a means of detection.

b. Laboratory (Not applicable)

2. Accomplishments

Following the finding of the two reinfested flour mills, the number of khapra beetle inspectors was increased. Inspections were carried on in the states of Baja California and Sonora according to schedule. There was a total of 1,776 properties inspected in Baja California, 1,567 of which were initial and 209 repeat. There were

II. PROGRAM ACTIVITY DURING FISCAL YEAR - Continued

C. 2 - Concluded

749 collections submitted for determinations which established new infestations in 25 properties and reinfestations in two properties. In Sonora, 41 properties were inspected, 13 of which were initial and 28 repeat. All of the 15 collections submitted for identification were negative. (See Table 1, PPC 7-15)

3. Statement or Table of Pest Damage

No commercial losses to commodities were sustained.

D. Eradication or Control

1. Procedures or Techniques Used

Fumigations have usually been carried out on Category One properties under contract by a commercial operator. The structures or objects to be fumigated are sealed under a leak-proof tarpaulin. Prior to sealing under tarps, the ground around the structure is given two treatments with malathion and oil. When the structure is ready for fumigation, methyl bromide is introduced through probes and sampling is made by instrument in order to maintain a 32-oz per 1,000 cu.ft. concentration for not less than 24 continuous hours during the required 48-hour period. Category Two properties where it is possible to apply treatment to units or separate objects are done by commercial operator or by program personnel. The Third Category permits interior fumigation by sealing openings and conducting fumigation without benefit of tarpaulins. This procedure, however, has not been used in Mexico.

2. Accomplishments

During the fiscal year 26 infested properties were treated and 25 released from quarantine restrictions. Three of these 26 were carry-overs from F. Y. 1957. The one infested property designated Category Two was fumigated in accordance with the prescribed treatment for this category; it will be released if the third and final 90-day inspection reveals no infestation. (See Table 2, PPC 7-15a)

E. Regulatory

1. Procedures or Techniques

The objective of the regulatory phase of the program is essentially to prevent the spread of the khapra beetle to uninfested sites and areas, under authority granted by Mexican Interior Quarantine #10. The quarantine is similar to the USDA khapra beetle quarantine in operation in the United States. Since the khapra beetle is incapable of flight and travels only a few feet of its own accord, dissemination of the pest is accomplished by the transportation of infested host materials or contaminated commodities from infested properties to new locations. This quarantine, therefore, in

II. PROGRAM ACTIVITY DURING FISCAL YEAR - Continued

E. 1 - Concluded

contrast to other quarantines for other insects, provides principally for the restriction of movement of products from infested sites rather than from areas designated as infested. This is qualified, however, in that certificates of treatment or cleanliness are required for susceptible products moving out of the Mexicali, B. C. and San Luis, Sonora zones to other parts of Mexico. Defensa Agricola personnel issue certificates for movement of host material after ascertaining if products from an infested site have been methyl bromide fumigated in accordance with the provisions of the regulations.

2. Accomplishments

In addition to the quarantine of all infested properties, all used sacks shipped out of the Mexicali district, regardless of origin, were required to bear a certificate of fumigation. At San Luis, Sonora at the railway and at the road station cooperatively operated for the inspection of northbound traffic, southbound railway cars and trucks carrying susceptible cargo are checked to determine if they are carrying khapra beetle host material and, if so, if the product carries the proper certificate from Mexican authorities as to origin and/or treatment. In the Mexicali zone there are six fumigation chambers which have been installed by mill owners or warehouse owners for fumigations of products from an infested property prior to its over-all treatment, permitting the movement of products from the premises, and for the fumigation of used sacks and other susceptible items moving into the premises. (See Table 3)

F. Methods Improvement None

G. Other

1. Cooperation Received During Fiscal Year

All of the work is cooperative between Defensa Agricola of the Mexican Department of Agriculture and Livestock and the PPC Division of the United States Department of Agriculture and is conducted through a Memorandum of Understanding between the two agencies. Defensa Agricola shares in the salaries of Mexican Nationals hired as inspectors for surveys and for assistance in fumigation treatments of infested properties. Supervisory personnel is furnished by USDA and in some phases of the fumigation treatments by Defensa Agricola as well. The cost of treatment of infested properties is shared.

2. Associated Activities and Services

a. Program Servicing

(1) Evaluation. The annual work conference on cooperative programs among Defensa Agricola of Mexico and Plant Pest Control, Plant

II. PROGRAM ACTIVITY DURING FISCAL YEAR - Concluded

G. 2 - Concluded

Quarantine and Entomology Research Divisions of the U. S. Department of Agriculture, with representatives from the state departments of agriculture of California, Arizona, New Mexico, Texas and Louisiana attending, was held in Mexicali, B. C., October 24-26, 1957. Status reports of program activities and informal discussions of mutual problems including khapra beetle comprised most of the program.

A khapra beetle work conference was held at Yuma, Arizona, May 22-23, 1958, with representatives of the PPC Division, Defensa Agricola of Mexico, and the state departments of agriculture of California, Arizona, and New Mexico in attendance. Reports of accomplishments for the states and Mexico were given and survey and fumigation problems discussed by the state supervisors and the area supervisor from the Western Area.

III. RECOMMENDATIONS FOR COMING YEAR

A. Survey

It is recommended that the additional khapra beetle inspectors be continued the coming year so that possible sources of reinfestations can be traced and eliminated.

B. Eradication or Control

It is recommended that the present procedures be continued.

C. Regulatory

Regulatory procedures initiated during this fiscal year should be continued.

D. Methods Improvement (Not applicable)

E. Associated Activities

It is recommended that a work conference similar to the one held in Yuma this year be held at some agreed upon city between the Mexico Region and the Western Region, with key personnel from both regions participating. This should include all state supervisors as well as officials concerned from state departments of agriculture within the Western Region; also representation from Defensa Agricola, Mexico, and from the PPC Division headquarters.

****

TABLE 1 KHAPRA BEETLE INSPECTION SUMMARY

REGION: MEXICO | PREPARED BY:

PERIOD (Designate: Month, 1-15, 16-31, or 1-31): JULY 1, 1957 - JUNE 30, 1958 | DATE PREPARED:

STATE A	INSPECTIONS INITIAL B	INSPECTIONS REPEAT C	INSPECTIONS TOTAL D	SPECIMEN COLLECTIONS SUBMITTED FOR IDENTIFICATION E	INFESTED SITES THIS PERIOD F	TOTAL SITES INFESTED FROM BEGINNING G	SITES TO BE TREATED End of F.Y. H	ESTIMATE OF VOLUME INFESTED THIS PERIOD (CU. FT.) I	TOTAL VOLUME INFESTED FROM BEGINNING* (EST. CU. FT.) J	TOTAL VOLUME INFESTED TO BE TREATED End of F.Y. K
Arizona										
California										
New Mexico										
Republic of Mexico										
BAJA CALIFORNIA	1,567	209	1,776	749	27		4	3,413,591		129,579
SONORA	13	28	41	15	0		0	0		0
F. Y.1958 ~~Total This Period~~	1,580	237	1,817	764	27		4	3,413,591		129,579
Total From July 1										
Total From Beginning of Program	3,926	356	4,282	1,395		73			15,110,230	

*Represents first time infestations only.

PPC FORM 7-18 (JULY 1958)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

STATE	INSPECTIONS				PERCENTAGE INSPECTIONS REQUIRED THAT WERE INSPECTED	TOTAL VOLUME INSPECTED THAT WERE REJECTED	ESTIMATE OF VOLUME INSPECTED THAT WERE REJECTED	TOTAL VOLUME INSPECTED THAT WERE REJECTED	TOTAL VOLUME INSPECTED THAT WERE REJECTED
	INITIAL	REPEAT	TOTAL						
A	B	C	D	E	F	G	H	I	J
Arizona									
California									
New Mexico									
Republic of Mexico									
Total Continental	1,207	308	1,515	198	27		2,413,204		520,279
Hawaii	14	34	48	12	0	0	0	0	0
F. I. Total Inspections	1,221	342	1,563	198	27		2,413,204		520,279
Total From July 1									
Total From Beginning of Program	3,884	380	4,264	1,395	73				12,170,230

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
FRUIT FEES INSPECTION DIVISION

Page 1 of 2 pages

Observance line for information only.
PDC Form 1-10
June 1 1947

TABLE 2 KHAPRA BEETLE TREATMENT SUMMARY

Region: MEXICO | Prepared by:

Period (Designate: Month, 1-15, 16-31, or 1-31): JULY 1, 1957 - JUNE 30, 1958 | Date prepared:

STATE A	SITES TREATED: This Period B	Since July 1 C	Since Beginning D	VOLUME TREATED (cu. ft.): This Period E	Since July 1 F	Since Beginning G	METHYL BROMIDE USED (Pounds): This Period H	Since July 1 I	Since Beginning J
Arizona									
California									
New Mexico									
Republic of Mexico		1/ 26	71		3.655,342	14.980,651		43,006	133,832
Totals		1/ 26	71		3.655,342	14.980,651		43,006	133,832

SITES TREATED AND HELD FOR FINAL CLEARANCE INSPECTION (Category 2)

STATE A	PROPERTIES TREATED: This Period B	Since July 1 C	Since Beginning D	CUBIC FEET TREATED: This Period E	Since July 1 F	Since Beginning G	NAMES OF SITES HELD H
Arizona							
California							
New Mexico							
Republic of Mexico		1	2		144,739	1.010,739	Rancho Roa (Hog)
Totals		1	2		144,739	1.010,739	

RETREATMENTS (From Beginning of program)*

STATE A	PROPERTIES TREATED: This Period B	Since July 1 C	Since Beginning D	CUBIC FEET TREATED: This Period E	Since July 1 F	Since Beginning G	REMARKS H
Arizona							
California							
New Mexico							
Republic of Mexico		2	3		1.900,213	1.902,213	(1) Molinera del Valle
							(2) Molinera El Clavel
Totals		2	3		1.900,213	1.902,213	

*These figures remain in these sections and accumulate over the extension of time.

PPC 7-15a (Feb.-1958)

1/ Two of these properties were reinfestations and are noted under retreatments.

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Pest Control Division

Table 3

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

Region - Mexico

Cooperative Inspection Stations

F. Y. 1958

Inspection Stations	Type of Inspection	Number of Inspections	Number of Passengers & Braceros	Pieces of Baggage & Express	RR cars & trucks cleaned &/or fumigated	Host Interceptions: Occasions MFF	Occasions CBF	Occasions PBW	Items MFF	Items CBF	Items PBW	Items KB
BAJA CALIFORNIA												
Tijuana	Plane	2,848	66,845	236,527	-	1,430	138	-				
Mexicali	Planes	1,221	14,286	51,730								
	Trucks	382		-		273	35	34				
	Railroad	-		14,400	150							
Ensenada	Plane	399	535	1,405		49	10	-				
	Boat	81	533	838		20	14	3/2				
SONORA												
San Luis	Rd.Station	12,124	-	-	-	967	50	217				
Benjamin Hill	RR cars	6,768	-	-	1,365							
	RR pssgr.	-	1/253,954	-		-	-	-	23,227	1,692	4,813	5K.
	Rd.Station	128,873	-	-	316	15,397	874	529				
Nogales	Plane	777	9,353	23,334	-	343	76	31				
	RR Mkt.Mail	Daily	-	-	-	319	66	-				
SINALOA												
Mazatlan	Rd.Station	39,817	81,012	-	1,882							
	Plane	413									2,510 and 1,075 cottonseed	k.
	RR cars	1,126	26,551	0	0							
	RR trains	522										
	Boat	344										
Terreros 2/	Rd.Station	10,723	-	-	327	-	-	-			367	
TOTALS		206,418	453,069	328,234	4,040	18,798	1,263	813	23,227	1,692	8,765	5k.

1/ 131,658 Braceros. 2/ Station operated since 2/21/58. 3/ 1,769 bales of bagging.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
PROGRAM COST DISTRIBUTION

TABLE 4

KHAPRA BEETLE PROGRAM	MEXICO REGION FOR COOPERATIVE PROGRAMS			Reg. Supervr.		Date 10 NOV 1958	F. Y. 1958
Source of Cash and Equivalent (A)	Planning & Direction (B)	Technical Assistance (C)	Survey (D)	Control (E)	Regulatory (F)	Other (H)	TOTAL (I)
1. PLANT PEST CONTROL ARS							
Headquarters	7,000	1,700					8,700
Western Area	10,000	8,700	13,100	75,500	4,000		111,300
2. SUB-TOTAL	17,000	10,400	13,100	75,500	4,000		120,000
3. OTHER							
Defensa Agricola						33,381	33,381
Patronatos						4,654	4,654
Mexican Federal Gov't. (Gen. Agent's office)						720	720
4. SUB-TOTAL						38,755	38,755
5. T O T A L	17,000	10,400	13,100	75,500	4,000	38,755	158,755
6. CONTRIBUTED SERVICES None							
7. T O T A L							
8. G R A N D T O T A L	17,000	10,400	13,100	75,500	4,000	38,755	158,755

1. PLANT PEST CONTROL DIVISION units. Areas named.
2. Sub-total for all PPC funds included in (1).
3. OTHER ORGANIZATIONS; measurable cash expenditure.
4. Sub-total for all OTHER ORGANIZATIONS, included in (3).
5. Totals of PPC and OTHER ORGANIZATIONS, (2) plus (4).
6. CONTRIBUTED SERVICES.
7. Total of CONTRIBUTED SERVICES (6) only.
8. GRAND TOTAL (5) and (7).

* --- *

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
SOUTHERN REGION

ANNUAL PROGRAM REPORT

KHAPRA BEETLE

July 1, 1957 - June 30, 1958

In cooperation with other
Federal, State, County, and Local Agencies

November 15, 1958
Gulfport, Mississippi

C. C. Fancher
Regional Supervisor

I. Highlights of Year's Program Activity

A. Accomplishments for the fiscal year

No khapra beetle infestations were found in the Southern Region of the Plant Pest Control Division during fiscal year 1958, nor have they been known to occur previously in the Region. The program operations consisted entirely of survey.

B. Major deviation from Work Plan

None.

C. Status of Program at close of year

All inspections in 8 of the 11 states comprising the Region were negative.

II. Program Activity during fiscal year

A. Planning and Direction

1. How planned and directed

It was planned at the beginning of the year to make initial inspections and repeat inspections in the several states of the major warehouses and their environs which stored produce known to be hosts of the khapra beetle. The grain elevators located at the various port areas in the states were considered of major importance in khapra beetle inspection, along with extensive peanut warehouse areas in the southeastern states. The principal seed houses and milling companies were included in the inspection plans. Survey plans were under the direction of the state supervisors and were put into effect by district supervisors and their field personnel.

B. Technical Assistance

1. Technical assistance provided to farmers and others by program personnel

Program personnel, both state and federal, distributed pamphlets concerning the khapra beetle to warehousemen, seedmen, millers, and county agents. Information was provided through personal contacts, also.

C. Survey

1. Procedures or techniques used.

   a. Field

      Visual inspections for the khapra beetle were made in warehouses mostly through the use of flashlights. Observations were made also in material such as sacks and burlap used in transporting host material of the khapra beetle. Locations that had received shipments in the past from infested areas were inspected also.

   b. Laboratory

      None.

2. Accomplishments

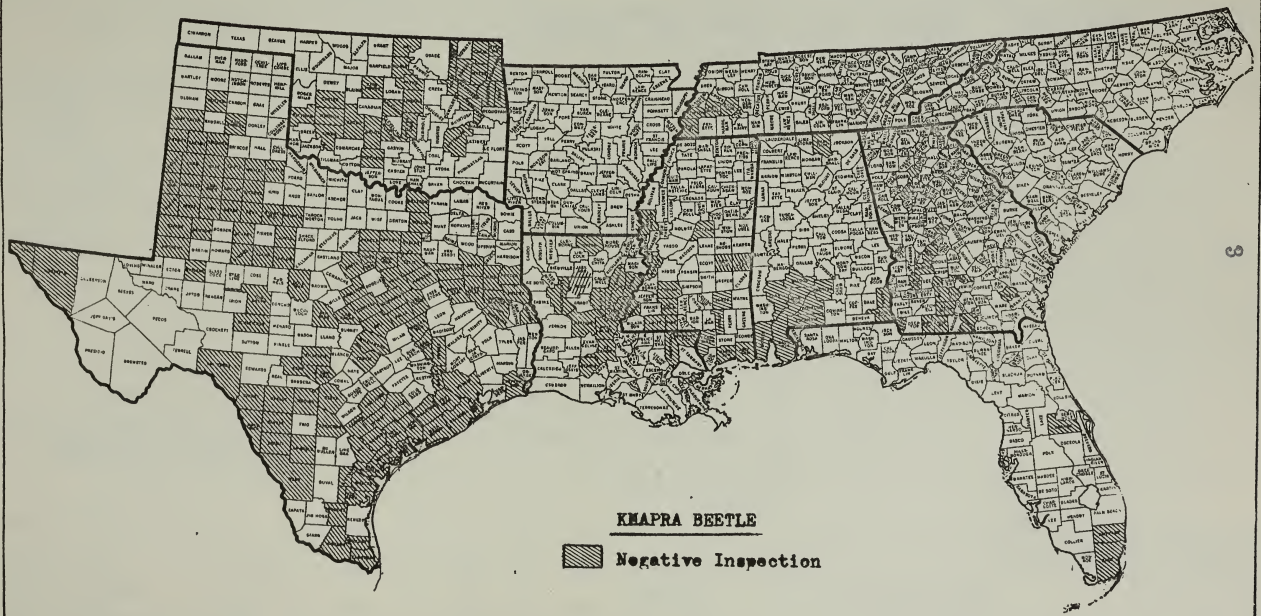
   There were 1,175 inspections made on 775 sites in 176 counties in the states of Alabama, Florida, Georgia, Louisiana, Mississippi, Oklahoma, Tennessee, and Texas, during fiscal year 1958. All inspections were negative.

III. Recommendations for the coming year

A. Survey

It is recommended that a comprehensive and accumulative survey be continued in all states comprising the Southern Region until the area has been thorougly covered.

SOUTHERN REGION
PLANT PEST CONTROL DIVISION



KHAPRA BEETLE INSPECTION SUMMARY

REGION: Southern

PREPARED BY:

PERIOD (Designate: Month, 1-15, 16-31, or 1-31): Fiscal Year 1958

DATE PREPARED:

STATE A	INSPECTIONS INITIAL B	INSPECTIONS REPEAT C	INSPECTIONS TOTAL D	SPECIMEN COLLECTIONS SUBMITTED FOR IDENTIFICATION E	INFESTED SITES THIS PERIOD F	TOTAL SITES INFESTED FROM BEGINNING G	SITES TO BE TREATED H	ESTIMATE OF VOLUME INFESTED THIS PERIOD (CU. FT.) I	TOTAL VOLUME INFESTED FROM BEGINNING* (EST. CU. FT.) J	TOTAL VOLUME INFESTED TO BE TREATED K
Alabama	33	21	54	12	0	0				
Florida	5	8	13	8	0	0				
Georgia	14	5	19	12	0	0				
Louisiana	17	25	42	1	0	0				
Mississippi	22	36	58	1	0	0				
Oklahoma	52	45	97	21	0	0				
Tennessee	13	22	35	1	0	0				
Texas	619	238	857	73	0	0				
** Cumulative totals include data for Arkansas, North Carolina, and South Carolina in addition to states listed above.										
Total This Period										
Total From July 1	775	400	1,175	129	0	0				
Total From Beginning of Program **	2,484	812	3,296	365						

*Represents first time infestations only.

PPC FORM 7-16 (JULY 1956)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION

KAPRA BEETLE PROGRAM

• • •

PROGRAM ANNUAL REPORT
1958 FISCAL YEAR

• • •

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

_____

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL DIVISION
WESTERN REGION

ANNUAL PROGRAM REPORT

KHAPRA BEETLE

July 1, 1957 - June 30, 1958

Cooperating Agencies:

State Departments of Agriculture,
Counties, Extension Agencies, Universities,
Individuals and Industries in the
Eleven Western States

October 30, 1958
Oakland, California

Jim R. Dutton
Regional Supervisor

TABLE OF CONTENTS

HIGHLIGHTS OF YEAR'S PROGRAM ACTIVITY

Accomplishment for the Fiscal Year

In the continuing search for khapra beetle infestations, a regionwide survey of susceptible establishments was conducted during the 1958 fiscal period in ten Western States. A total of 19,603 initial and 29,706 repeat inspections was made, and 78 existing infestations were found. Arizona reported 46 finds and California 32.

The acceleration of inspection activity over preceding years was particularly noticeable in the infested states of California, Arizona, and New Mexico. California reported that this stepped-up program has resulted in accomplishing almost three times as many inspections as were made in 1957. About 75 percent of the planned inspection on consumer properties in Arizona has been made. Additional state cooperation in New Mexico has in turn accelerated their program.

Fumigation treatments were conducted on 87 establishments comprising a volume of 10,767,538 cubic feet. A total of 111,530 pounds of methyl bromide was used in all treatments. At the close of the fiscal year, there remained only three known infested properties to be treated in California and three in Arizona.

Major Deviation from Work Plan

The work plan as outlined at the beginning of the year was closely followed.

Status of Program at Close of Year

Subsequent to the initial finding of an infestation of Khapra beetle in California in 1953, 537 properties have been found to be infested in the Western Region. The volume subject to fumigation on these properties contained an estimated 133,692,948 cubic feet. Regional infestation was confined to the States of Arizona, California, and New Mexico. Although only six known infestations remain to be treated at the end of the fiscal year, it is expected that the extension of inspection to heretofore non-inspected properties, will uncover additional infestations.

PROGRAM ACTIVITY DURING FISCAL YEAR

Planning and Direction

How planned and directed

In states of the Western Region, the program is conducted by the Plant Pest Control Division in cooperation with the various State Departments of Agriculture and associated agencies. While most of the states do not have direct appropriations for khapra beetle eradication, their general budgets permit them to participate as agreed in annual work plans. In the states of infestation, direct appropriations are maintained for survey and treatment. Work plans are formulated on an annual basis at a formal conference held each year with representatives of California, Arizona, New Mexico, and the Republic of Mexico. Informal local conferences are held as conditions warrant and work progress is reviewed periodically by Plant Pest Control Division and state representatives concerned.

Technical Assistance

Technical assistance provided to farmers and others by program personnel

Program personnel maintained a working relationship with County and Extension agencies, commercial establishments, and property owners, advising them of infestation occurrence and related problems of mutual concern. Assistance was also rendered to owners of infested establishments in their treatment of commodities moved under certification.

Technical fumigation advice was extended to the Mexico Region Plant Pest Control Division during the current year in assisting them in conducting large volume fumigations in Baja California.

Technical assistance provided to program by cooperating agencies

Personnel of the Stored Products Insect Section, Agricultural Marketing Service, have discontinued

their studies on fumigation and associated problems of research, which have been conducted at their laboratories in California and Arizona. Their studies on biology and attrahents have been taken over by research personnel of the University of California Citrus Experiment Station at Riverside, California.

Survey

Procedures or techniques used

There was no deviation from general program survey procedure.

Field

Some use was made of grain grading screens to sift out heavy materials from bulk commodities inspected. Trap bags were placed in bulk storage bins as an aid to detection.

Laboratory

None

Accomplishments

In most areas of survey, the planned program of inspecting commercial and consumer properties was not completed. However, the schedule of inspection within the infested states was current at the close of the year.

Statement or table of crop losses

Losses to stored grain products due to infestation were difficult to estimate this year. This was due in part to the small amounts of host materials involved on the infested properties. An estimate of the potential loss from infestation, however, was frequently brought to light by the severity of some infestations where losses to host materials ranged up to 50 percent.

Eradication or Control

Procedures or techniques used

The adopted fumigation schedule of holding gas concentrations at 32 ounces or better for a period of

24 hours during a 48-hour exposure, has been somewhat revised during this fiscal period. Due to difficulties encountered in penetrating certain bulk commodities and ground surfaces, it was decided that to insure a more complete mortality, higher and longer sustained gas concentrations would be essential. Insofar as possible, we are now attempting to maintain 32 ounces CH_3Br or better per 1000 cubic feet for the entire 48 hours of exposure.

Accomplishments

Eradication fumigation treatments were applied to all known infestations with the exception of six premises in Arizona and California. These establishments were under contract and scheduled for treatment as soon as conditions permitted. No fumigation injuries were reported in 87 fumigations despite the latent hazards involved in the handling of 111,530 pounds of methyl bromide.

Regulatory

Procedures or techniques used

Delays encountered in some property treatments necessitated closer supervision of commodity fumigations and movement of regulated materials from infested premises.

Accomplishments

There were 3,550 shipments of host materials certified for movement under State and Federal quarantines in Arizona. Very little interstate movement was recorded from California.

Methods Improvement

Work performed

Fumigation schools were conducted in Arizona covering the calibration and operation of gas analysis instruments, fumigation chamber testing equipment, and other related problems. Survey indoctrination sessions were conducted throughout the region.

Trap bags were used to augment regular procedures in the inspection of bulk host materials. Bags of various colors were tried but were rejected as being ineffective. The search for an attrahent continued, with several materials being tried in heavy infestations in Mexico. Division-owned plasticized nylon fumigation tarpaulins were reconditioned during the year. Techniques of replasticizing these covers were greatly improved.

Accomplishments

Results of the above work performances were of such a nature that the survey aids as developed were adopted as part of the work routine. The use of recoated nylon tarpaulins was of direct value in reducing the amount of gas used in fumigations made by Division personnel.

Other

Cooperation received during fiscal year

Major contributions received and importance to program

In practically all states the major cooperative contribution received has been the furnishing of survey personnel by the various State and County Departments of Agriculture. Without this assistance, planned survey would be appreciably reduced due to insufficient manpower. As an example, personnel of the Utah State Department of Agriculture accomplished 50 percent of the planned survey in that state during the current year. In the infested states of Arizona, California, and New Mexico, direct appropriations allow the Departments of Agriculture to conduct allied surveys and contribute to treatment of infestations. Contract fumigations in California, for instance, are financed by the State with the Division furnishing technical assistance and methyl bromide. This greatly reduces the burden of cost, which is directly assumed by the State.

Other agencies cooperating this year have been the Bureau of Indian Affairs in Arizona, which agency cooperated during treatment of properties on regionwide tribal land in that State, and the various county governments which have assisted in survey and regulatory functions.

Cooperative work needing strengthening another year

The continued maintenance of cooperation between Plant Pest Control Division and the states and industry involved is very important. In several instances this cooperative understanding needs strengthening and should be a prime responsibility of the supervisors in charge.

Associated activities and services

Program servicing

During the year, sets of ARS 35mm color slides and accompanying legends depicting the khapra beetle program were received from Division headquarters and distributed to the Plant Pest Control State Supervisors. These slides received a broad showing and contributed toward a better understanding of the khapra beetle problem between Division employees and industry. The slides were also used in orienting State and Division personnel on methods and importance of survey, appearance of the insect, and methods of control operations.

In addition, a revised 16mm color movie received an enthusiastic reception among interested public and agency groups. Pictorial brochures were also generously distributed as part of the program to keep the general public alert to the khapra beetle menace. In Oregon an intensive short-course training school was presented by State, State College, and Federal personnel, using microscopes and hand glasses to aid in the identification of khapra beetle and other storage insect specimens.

RECOMMENDATIONS FOR COMING YEAR

Survey

The inspection program needs expansion in all states concerned. The demands of planned inspection, expecially within states of infestation, should be met by increasing the staff of trained permanent personnel and not relying on temporary employees.

Eradication

The present program of fumigation should be continued with added emphasis being placed on treating infested establishments as soon as possible after they are found.

Regulatory

No recommendation

Methods Improvement

The use of survey aids such as an attrahent, trap bags, and grain sieves, should be encouraged in all phases of the survey endeavor. Much work remains to be done in further evaluating the use of these working tools.

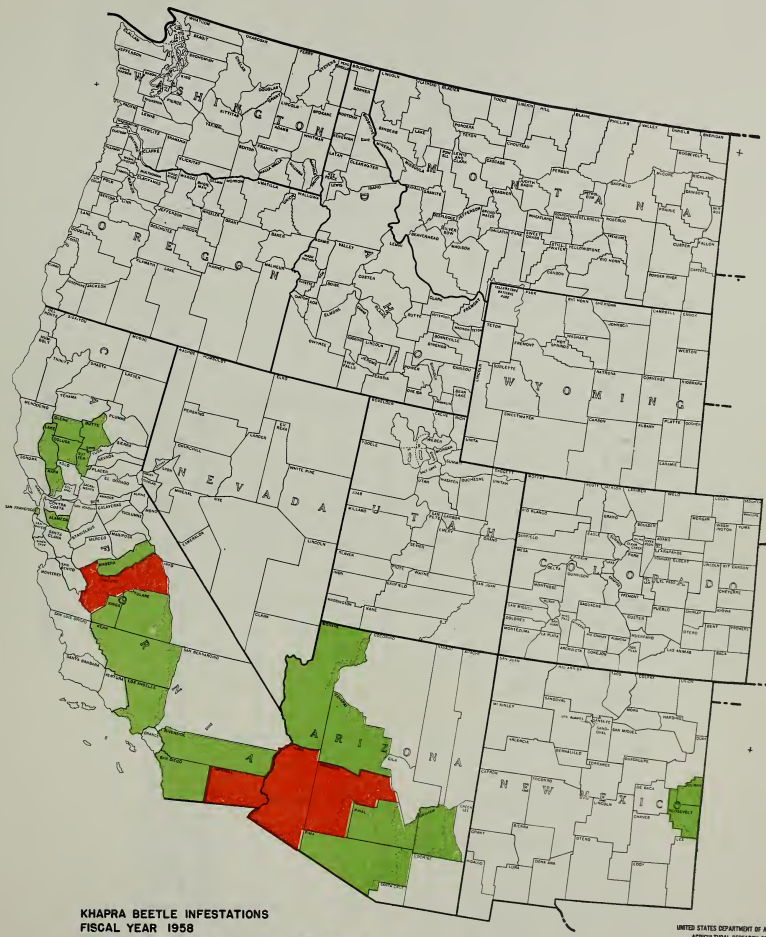
The continued search for methods of improving fumigation operations should be encouraged in all phases of treatment.

Other

Cooperative relationship with some states needs revision. In this respect, line of program responsibility should be clearly defined and adjusted to fit program needs.

More attention should be directed toward the use of visual aid material.

KHAPRA BEETLE ERADICATION



GPO 977337

SUMMARY OF ASSOCIATED ACTIVITIES

Khapra Beetle

Fiscal Year 1958

Area	Public Meetings Attended	Presentations					Feature & News Stories*	Extent These Aids Were Used				Special Reports
		Talks	Slides	Films	Radio	TV		Exhibits	Bul.*	Cir.*	Infest.Map & Posters	
Arizona	2	2	2							2,100		
California	5	3	2	1		1						
Colorado	2	2	2					1				
Idaho	1	1	1						20			
Nevada	6	1							2	22	3	2
Oregon	2	2		3					150			
Washington	3	3	1	3					850			
Utah	4	3	4		2		1		5	64	2	4
Total	25	17	12	7	2	1	1	1	1,027	2,186	5	6

* Written by Federal personnel for release direct or through cooperators.

Khapra Beetle

INSPECTION SUMMARY

Fiscal Year 1958

State	Inspections			Specimen Coll. Submitted for Ident.	Inf. Sites from Jul 1	Sites Inf. from Begin.	Sites to be Treated	Est. of Vol. Inf. from Jul 1 (cu. ft.)	Total Vol. Inf. from Beginning (Est. c.f.)	Total Vol. Inf. to be Treated
	Initial	Repeat	Total							
Arizona	5,877	2,824	8,701	2,168	46	201	3	7,154,743	52,793,348	344,308
California	12,120	25,670	37,790	10,741	32	330	3	2,830,000	80,458,680	465,000
Colorado	105	165	270	334	0	0	0	0	0	0
Idaho	68	25	93	62	0	0	0	0	0	0
Montana	43	0	43	11	0	0	0	0	0	0
Nevada	7	21	28	5	0	0	0	0	0	0
New Mexico	895	495	1,390	472	0	6	0	0	440,920	0
Oregon	138	200	338	1	0	0	0	0	0	0
Utah	2	140	142	8	0	0	0	0	0	0
Washington	348	166	514	82	0	0	0	0	0	0
Wyoming	0	0	0	0	0	0	0	0	0	0
Total, end of year	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	6	XXXXX	XXXXX	809,308
Total From July 1	19,603	29,706	49,309	13,884	78	XXX	XXX	9,984,743	XXXXX	XXXXX
From Beginning of Program	63,920	54,678	118,598	34,921	XXX	537	XXX	XXXXXX	133,692,948	XXXXX

TREATMENTS-CATEGORY 1

State	Properties Treated		Volume Treated (cu. ft.)		Methyl Bromide Used (Lbs.)	
	Fiscal Year 1958	Since Beginning	Fiscal Year 1958	Since Beginning	Fiscal Year 1958	Since Beginning
Arizona	53	198	8,118,018	52,368,447	85,364	489,992
California	33	327	2,624,000	79,993,680	25,961	642,315
New Mexico	1	6	25,520	440,920	205	3,885
Totals	87	531	10,767,538*	132,803,047	111,530	1,136,192

* Difference in volume treated as against volume found infested during Fiscal Year 1958 represents carryover of infested volume found in Fiscal Year 1957 but not treated.

PROPERTIES TREATED AND HELD FOR FINAL CLEARANCE INSPECTION - CATEGORY 2

State	Properties Treated		Volume Treated	
	Fiscal Year 1958	Since Beginning	Fiscal Year 1958	Since Beginning
Arizona	0	17	0	5,855,823
California	4	21	65,600	3,303,038
New Mexico	1	5	25,520	339,520
Totals	5	43	91,120	9,498,381

RETREATMENTS (From Beginning of Program)

State	Properties Treated		Volume Treated		Remarks
	Fiscal Year 1958	Since Beginning	Fiscal Year 1958	Since Beginning	
Arizona	1	3	94,233	3,537,169	Methyl Bromide used on retreatments not included in Category 1 table above.
California	7	20	3,288,745	8,820,500	
Totals	8	23	3,382,978	12,357,669	

Khapra Beetle EXPENDITURES BY SOURCE AND ACTIVITY Fiscal Year 1958

Source of Cash & Equivalent*	1 Planning & Direction	2 Technical Assistance	3 Survey	4 Control	5 Regulatory	6 Methods Improvement	7 Other	8 Total
Plant Pest Control Division	$ 29,545	$ 1,240	$292,002	$ 212,857	$ 500	$ 31	$ 79	$536,254
Other Organizations (Name)								
State Depts. of Agriculture	13,925	6,675	99,468	127,534	9,273		858	257,733
Subtotal Other Organizations	13,925	6,675	99,468	127,534	9,273		858	257,733
Total (of PPC & Other)	43,470	7,915	391,470	340,391	9,773	31	937	793,987
Contributed Services**								
Depts. of Agriculture								
States	8,520	400	475		20,544			29,939
Counties	20,000	300	75,000	5,000	21,041			121,341
Extension Service	200		300					500
Universities	200	125	275					600
Individuals			2,000					2,000
Total	28,920	825	78,050	5,000	41,585			154,380
Grand Total	$ 72,390	$ 8,740	$469,520	$345,391	$ 51,358	$ 31	$ 937	$948,367

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.

Khapra Beetle — COOPERATIVE AID RECEIVED — Fiscal Year 1958

	1	2	3	4	5	6	7	8
State and Source of Aid	Cash and Equivalent Aid*				Total of Cash & Equivalent	Intangible Service Estimate**	Source Grand Total	Remarks
	Cash	Personal Services	Equipment & Supplies	Space				
State Depts. of Agric.								
Arizona		$ 70,410	$ 3,000	$ -	$ 73,410	$ 9,100	$ 82,510	
California		147,800	-	-	147,800	19,444	167,244	
Colorado		6,800	-	-	6,800	-	6,800	
Idaho		50	-	-	50	475	525	
Nevada		1,200	400	100	1,700	-	1,700	
New Mexico		15,605	300	-	15,905	500	16,405	
Oregon		1,000	-	-	1,000	150	1,150	
Utah		690	128	-	818	120	938	
Washington		10,250	-	-	10,250	150	10,400	
Counties								
California		-	-	-	-	121,041	121,041	
New Mexico		-	-	-	-	300	300	
Exten. Services								
Idaho		-	-	-	-	300	300	
Oregon		-	-	-	-	100	100	
Washington		-	-	-	-	100	100	
Universities								
Oregon		-	-	-	-	100	100	
Washington		-	-	-	-	500	500	
Individuals								
Oregon		-	-	-	-	1,000	1,000	
Washington		-	-	-	-	1,000	1,000	
Total This Period		$ 253,805	$ 3,828	$ 100	$ 257,733	$ 154,380	$ 412,113	

* Limited to direct appropriation, allotments from other sources, services and supplies for which there is an actual cash expenditure.

** Limited to services incidental to other activities for which only an estimated value is available.